ROCK PRODUCTS

MARCH, 1948 THE INDUSTRY'S RECOGNIZED AUTHORITY VOL. 51, No. 3

Bror Nordberg, *Editor*
Stanley A. Phillips, *Manager*
Nathan C. Rockwood, *Editorial Consultant*

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"WE HEAR..."

March, 1948

In his report to the president the first of the year, Major General Fleming, administrator of the Federal Works Agency, said that some $75 billion of state-sponsored public works would be needed over the next few years. He expressed the possibility that a sudden business recession might suddenly call for such public works and would find the states short of prepared plans, in urging a renewal of planning programs.

* * * * * * * * * * *

A booklet, "World Chemical Developments, 1940-46," is now available for those who would find out about chemical developments in many parts of the world. The booklet is available for 30 cents from the Superintendent of Documents, Washington, D. C.

* * * * * * * * * * *

State spending for highways in 1948 will likely total a record $1.5 billion, predicts Engineering News-Record, as the result of a survey of state highway executives. This would compare with $1.341 billion in 1947 when $928 million was spent for new construction, $357 million for maintenance and $56 million for the purchase of construction equipment.

* * * * * * * * * * *

United States Chamber of Commerce index of production of construction materials reached a new high recently of 156 (1939 equals 100). But inventories of building materials are still low and shortages still plague the industry.

Construction costs had reached a record high last December. The American Appraisal Co. national average construction cost index reached 468 that month which compares with an index of 100 in 1913. This represents an increase of 33 per cent since decontrol in November, 1946, and 134 per cent over the 1939 average.

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In a National Labor Relations Board ruling, the Taft-Hartley clause permitting the Board to levy back-pay awards against a union responsible for illegal discharge of workers is not retroactive.

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On a rural road in Dauphin County, Penn., highway engineers are studying a new type of precast concrete bridge deck that was manufactured by the vacuum process. This process, discussed in several earlier issues of ROCK PRODUCTS, is reported to cost 25 per cent less than a poured-in-place slab and may reduce considerably the time a bridge must be closed to traffic.

* * * * * * * * * * *

Union wage rates in the building trades have increased 52 per cent since 1939, of which 80 per cent occurred since the war's end, according to a report of the U. S. Bureau of Labor Statistics.

* * * * * * * * * * *

Developments in Drilling Mud Control, a recent article by G. E. Cannon in the Oil and Gas Journal, mentions the use of hydrated lime in lowering viscosity of mud in oil well drilling. Reaction of lime with the drilling mud is not restricted to any particular type of shale, and Mr. Cannon continues by stating that from 50 to 100 lbs. of lime are used for each drilling site per day.

WE HEAR

The United States Employment Service expects September to be the peak month in building activity, when an anticipated 2,150,000 workers will be employed by construction contractors.

* * * * * * * * * * *

President Truman placed before Congress an 11 billion dollar Federal-State-City public school construction program, covering all phases from elementary schools to institutions of higher learning, to extend over a five to seven year period. Some government sources foresee an added need for about $1,000,000,000 annually for each year after the period now under discussion.

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Two cement company quarry employes were injured recently when loose rock fell from the top of the face on which they were working. Preventable "accidents" still occur too frequently in the rock products industry.

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Guaranteed annual wages are under study by the president's Council of Economic Advisers and a report of its findings may soon be anticipated. The principles had been endorsed by an advisory committee to the Office of War Mobilization and Conversion but its approval was conditioned, however, on its adoption through collective bargaining, rather than imposition by legislation.

* * * * * * * * * * *

According to a recent issue of the New York Times, young men on many of the South Sea Islands bleach their hair with coral lime in order to make themselves more acceptable to the fairer sex. Is our lime industry passing up a ready source of revenue here at home?

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Cost of establishing an employe's beneficial trust fund as an inducement to retain workers is not permissible as an income tax deduction, according to a ruling of the U. S. Tax Court.

* * * * * * * * * * *

A simple process, recently patented, is one whereby waste fluorine, recovered in the production of superphosphate by treating phosphate rock with sulfuric acid, is treated with lime to produce calcium fluoride. This chemical is much in demand as a flux in the basic open hearth in lieu of fluorspar.

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Britain is having a serious lack of labor for the production of limestone, that has serious repercussions in the steel industry in that country.

* * * * * * * * * * *

Of the $500,000,000 in Federal funds authorized by Congress to assist in a nation-wide 7-year airport development program, $77,500,000 has already been appropriated, according to W. R. Macatee, manager, airports division, American Road Builders Association.

* * * * * * * * * * *

An employer cannot be eligible for a refund of income taxes illegally or erroneously collected unless he files a refund claim within two years of the time of overpayment.

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If the universal military training program is enacted into law by this session of Congress, several billion dollars in permanent construction costs will be required, in the words of Rear Admiral Thomas L. Sprague.

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According to a National Labor Relations Board ruling, an employer cannot require that a discharged employe withdraw charges of unfair labor practices against him as a condition of reinstatement.

* * * * * * * * * * *

Highway construction costs in 1947 were 90 per cent above the 1940 level and 14.5 per cent higher than in 1946. As a result of the high level of costs, 15 per cent of the low bids, totalling $115 million, were rejected as excessive.

THE EDITORS

★ ★ Editor's Page

"IT MAY BE LATER THAN YOU THINK"

OUR HEADING here is the fitting title for a forceful and inspiring talk on sales given by Frank J. Lovejoy, president of the Executive Club of New York City, before the convention of the National Crushed Stone Association. The speaker is an experienced salesman and a master of oratory, but behind his dynamic and highly entertaining presentation were valuable sales tips and a timely warning that bears heeding by salesmen and by industries—all industry.

His accusation that it requires a recession or some such drastic emergency to wake industry up to the need for marketing its goods has, unfortunately, proven true far too often. And no more truthful axiom could have been recited than that the time to sell is *now*, when business is good; that it is already too late when the need for selling is recognized as at hand. It doesn't take a genius to recognize that plain fact, but complacency implements prosperity in de-emphasizing that the need for action is at hand, in order to preserve markets and stimulate new business. Recent developments right in the rock products industry illustrate the fallacy of inaction.

Results of Short-Sightedness

No better example of what can and will happen to those companies which refuse to stimulate sales ahead, or even believe it necessary, could be cited than the agricultural limestone industry. There was panic last Summer when, without warning, all federal subsidy payments for agricultural limestone were abruptly cut off. Fortunately for many companies, the program was soon resumed though on a curtailed scale.

A big number of producers who were content to flourish by the simple process of order-taking, and who thought it unnecessary or that they did not have the time or the personnel to sell the merits of soil liming to the farmer, found themselves up against it. There were casualties in the space of two short months. Others of the class we refer to, those that had the capital to tide them over, have resumed their happy-go-lucky course of order-taking; they still refuse to recognize that an economy-minded Congress now in session could well knock them out of business permanently.

Some have heeded the warning. They have taken to merchandising or have accelerated efforts in that direction. There are cases where products for entirely new uses have been developed by purely agricultural limestone producers and which are being sold to build future business. Warnings have been directed to that industry time and again, and incidentally through the pages of ROCK PRODUCTS, but it took a forced recession to drive the point home.

Equally effective but less drastic in the speed of reaction will be the return of old-time competition in all business. Already there are signs on the business front that the inflationary boom is tottering and that we may finally be entering the leveling off period that so often has been predicted as at hand.

Keeping a Product Sold

Another statement of Mr. Lovejoy's that "the best time to sell a product is after it has been bought," applies to the reputation of industries, or companies, and their products. It is in the preservation of existing markets which is of primary importance to the producers of aggregates and other building materials. This brings us to the functions of laboratory research, which is the best sales tool, certainly for the aggregates industry, to ward off competition and to guard against quickly losing a reputation that has taken years to gain.

Those who are members of trade associations often are inclined to accept industry research as a necessary item of expense which they accept as a matter of fact, and never for the moment realize that they might not even be in the business were it not for research accomplished at the industry level.

It matters not that a research project is inspired because of a complaint in some other part of the country, say on the properties of an aggregate; solutions to such special problems more often than not eventually take on national significance.

After all, isn't the use of concrete as a construction material being challenged because of alleged unsatisfactory durability? Aggregates and cement have been used for years and years in concrete but the only way to keep them used, in Mr. Lovejoy's words, is to keep selling them in an application such as this where they are already accepted by purchasers. The means to this end stem from facts developed out of laboratory research that can be used in a continuous job of selling.

The trade associations serving the principal rock products industries very evidently have the proper appraisal of market preservation and building; it remains for companies comprising the membership to take the cue. It still isn't too late.

Bror Nordberg

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Rocky's NOTES

Nathan C. Rockwood

Highway Research Developments

HIGH COSTS, shortage of engineers, the rising tax burden and other causes are delaying the start of a tremendous highway construction and reconstruction program; but technical brains are ever busy working out ways to spend the public's money to better advantage. This conclusion is inescapable from a perusal of the recently issued December "Highway Research Abstracts" published monthly by The Highway Research Board, National Research Council.

The national associations of all producers and manufacturers of highway construction materials are represented on the Board, as well as the engineering societies and government departments. Some months later the complete transactions will be published in book form for those of our readers who may want to pursue the subject matter farther.

Express Highways—Finance

As all interested in highway construction already know, a great deal of the money available for highway improvement will be spent for express highways into, between and around large metropolitan centers. This involves enormous expenditures for rights-of-way and property damages which will never find its way into actual construction costs. Highway officials are attempting to develop scientific ways of estimating such right-of-way costs.

If the usual political methods are used, it is obvious that there will be still less of the appropriations available for construction. Anything producers and manufacturers of construction materials can do to promote fair and honest appraisals obviously will be to their own advantage as well as that of the public.

Rock products producers should be equally interested in seeing that the various schemes for financing public highway improvements are sound. As local taxpayers, as well as income taxpayers, they have a direct interest in sound finance, regardless of immediate gains from uneconomic and extravagant public expenditures.

We'll pass over the papers on pavement design to some on new methods of making topographical and geological surveys. These are important to producers because deposits of sand, gravel and rock are located in this manner, which may be used by competitors or by themselves where rising transportation costs eliminate present sources or the products of established plants. As will be noted a little further on, there is likely to be a rapidly growing demand for granular materials for use on subgrades of pavements, and in many localities materials plenty good enough can be obtained near at hand.

Surveys and Geology

In order to make some estimate of subsurface and geologic conditions, seismology and aerial photography are being employed. The State of Indiana officials have had much experience with the preparation of topographic maps from aerial photographs and have learned how to interpret them so as to be able to spot underlying deposits of gravel or rock. These surveys are useful to the engineers mainly to determine drainage needs and traffic bottlenecks. The U. S. Geological Survey has adopted aerial photography for its topographical map-making, and in the next 20 years will have such maps for the entire country. Under a policy recently adopted, photographic reproductions of its full-scale work maps may be had by anyone at actual cost. These are on a scale of 1:5000 or 1:6000, while the published maps are on a scale of 1:24000.

Faulty Subgrades

Many times in these columns we have emphasized the necessity of preparing subgrades for any type of pavement with granular materials—products which any aggregates producer can readily supply. One evidence of faulty subgrade is the pumping action of concrete slabs under heavy wheel loads. Iowa state highway studies have led to the conclusion that pavements placed on subgrade soils that contain not less than 50 per cent of the fraction retained on the No. 270 sieve (0.05 mm. particles) do not have this trouble; and that subbases composed of granular materials placed over fine-grained or pumping soils will prevent pumping. The minimum requirement is a thickness of from 3 to 12 in. There is nothing new in this, but it is interesting and helpful to producers when one state highway department after another is convinced by its own research and experience.

Other highway engineers are apparently pursuing the old routine of a compacted subgrade and heavily reinforced concrete slabs, without either transverse or longitudinal joints, as a means to prevent cracking. The wiser highway engineers are apparently aiming at a compacted subgrade of granular materials which will drain readily as well as furnish pavement support. There is another advantage in a granular subbase, which does not seem to be generally recognized, and that is its ability to absorb the excess water from the wet concrete and thus make a better and more impermeable concrete. This drawing together between pieces of aggregate of the crystallization products in the cement by capillarity through drainage into an absorptive medium was pointed out by LeChatelier as far back as 1903, but concrete engineers consistently ignore it. The same principle is made use of today in a patented process of sucking out the excess water by a vacuum.

The highway engineers of Illinois after considerable experience with compacted subgrades of any old material have also come to the conclusion that subbases which contain 55 per cent or more of granular material (coarser than No. 270 sieve) do not pump; that under existing conditions of traffic, 6 in. of granular subbase will prevent pumping.

Pavement pumping has been especially studied in Indiana where in 1943, approximately 6 per cent of all rigid type pavements were affected; by 1947 the percentage had risen to 12 per cent. In our Middle West farm states the problem is thus shown to be a very serious one, which, strange to say, could have been avoided by attention to the cardinal principle of all road-building—adequate drainage. Iowa's experience has shown that it is not high-speed, heavy wheel loads that cause most of the pumping, but the slower traffic on the upgrade of hills.

Air-Entrained Concrete Helps Poor Aggregate

Perhaps the most encouraging bit of research in Indiana was to determine the effect of air-entraining concrete made with two aggregates, one gravel and the other limestone, which had very bad service records. Laboratory tests of freezing and thawing with normal portland cement paralleled these aggregates' poor field performance, but embedding these same aggregates in air-entrained concrete, even with an air content of only 0.2 per cent, gave greatly better resistance to freezing and thawing, or durability tests. No explanation has been given, and it may be simply that the air-entrained concrete is less permeable. In any event, if other tests and experience verify those given, it may mean acceptance of some aggregates previously rejected on their prior service records.

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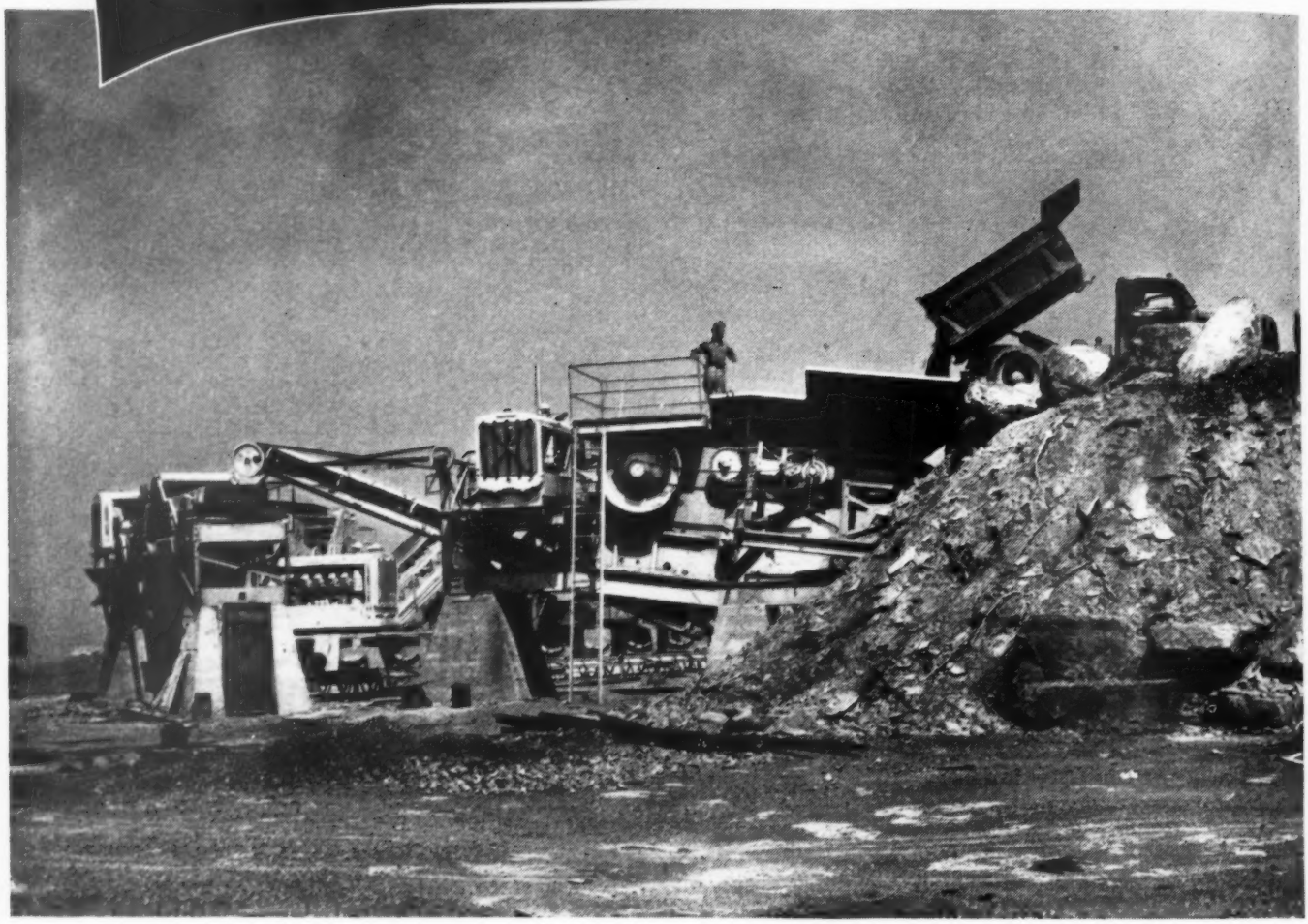

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Association NEWS

WITH most of the major conventions of associations serving the rock products industries now a part of 1948 history, the industry officials are now concentrating on several major problems which may affect their destiny for years to come. The sharp boost in freight rates asked by the railroads, if granted by the I.C.C., would narrow markets due to the tendency to restrict length of hauls, and would cause producers to turn to truck and water transportation for relief.

In the case of industrial sand, the National Industrial Sand Association in its Ex Parte 166 statement of protest to the I.C.C. pointed out that the average value of industrial sand is $1.60 per ton; the weighted average freight rate to which the Ex Parte 162 increases applied was $2.01 per ton. The 30-cent maximum on top of the weighted average 1945 rate of $2.01 pushes the freight charge up to $2.31 which is 144 per cent of the value of the commodity. A further increase up to 60¢ per ton, by adding the maximum increase to both factors of a combination rate, would make that sand subject to transportation charges 163 per cent of the value of the sand. The extra 30¢ is almost 20 per cent of the value of the commodity. It was pointed out that no shipper has a margin of profit permitting him to absorb freight up to 20 per cent of his selling price.

Producers of agricultural limestone are expressing considerable concern as to the fate of appropriations for 1948 and 1949 with an economy-minded Congress. President Truman in his budget message asked for $150,000,000 for the 1948 Agricultural Conservation program and $300,000,000 for 1949. The industry is seeking through the Agricultural Limestone Division, National Crushed Stone Association, and the National Agricultural Limestone Association to increase the 1948 funds, and to at least hold the line for the 1949 program of $300,000,000. The Senate Committee on Agriculture and Forestry recently presented to the Senate its report on a long-range agricultural policy and program. Four pages of the 68-page report are devoted to a discussion of the conservation, restoration, and development of our soil, water and forest resources. The report emphasizes that past exploitation of the soil has made possible our high standard of living and large industrial development, but it has never been paid for by the public in restored fertility to the depleted soils. It further points out that the only effective, practical way to stimulate farmers to carry out soil programs is through incentive payments to partially cover the cost of limestone, phosphate, terracing and other soil improvements which have a long-term value.

Missouri Agstone Producers Meeting

JEFFERSON CITY, MO., was host to the Missouri Limestone Producers Association at its second annual membership convention held the first week in January. Approximately 60 members and associate members were in attendance.

Two major speeches were presented during the meetings, the first by J. W. Burch, director, Missouri Agricultural Extension Service, who was heard during an afternoon session. His comments were directed toward farm production phases of agricultural limestone. He stated that although 1947 was the banner year in Missouri for agricultural limestone use, with over three million tons spread on farms, limestone producers in this State would have to process and spread a million more tons annually if the yearly loss of calcium carbonate equivalent from Missouri farms was to be replaced. Missouri farms require about 4½ million tons of lime annually to compensate for annual losses, not including lime requirements due to historical losses.

At a luncheon meeting, Dr. E. L. Clark, Missouri State Geologist, described "Missouri Limestones and Dolomites." He stated that there are more than one hundred specific classes of these two general types of stone deposits in Missouri from which agricultural limestone and other stone products are made. Mr. Clark pointed out that Missouri is in a fortunate raw material position as adequate deposits of satisfactory stone for agricultural limestone are located in nearly all of the 114 Missouri counties, thus reducing transportation costs and increasing quality production through sound competition. He referred to the fact that Missouri probably had more agricultural limestone producers than any other state in the country with 150 in the business.

New Officers

During the business session, the following officers and board of directors were elected: L. W. Hayes, Kansas City, president; Ben P. Donnell, Valley Dolomite Corp., St. Louis, vice-president; Arthur R. Alvis, Butler, secretary-treasurer; Paul N. Doll, manager; and Ray Howerton, Ashley; L. H. Bray, Rolla; C. E. Thomson, Dietz Hill Development Co., Kansas City; J. J. Griesemer, Springfield; Oliver Taetz, Gray Summit; and Merl Hamill, Canton, directors.

Another highlight of the meeting was the exhibit prepared for limestone producers, and set up in the mezzanine of the convention hotel. In general, displays were directed to improving publicity activities of members of the association, with mats for newspaper advertisements as the center of attraction. Each mat told a different story of the value of agricultural limestone. The new Association decals also were displayed for the first time. In three colors, they show the name and goals of the Association together with a map of the state.

Members of the new board of directors, Missouri Limestone Producers' Association. Left to right: Ben P. Donnell, St. Louis; L. H. Bray, Rolla; Paul N. Doll, Jefferson City; L. W. Hayes, Kansas City, secretary; J. J. Griesemer, Billings; Merl Hamill, Canton; C. E. Thomson, Kansas City; and Arthur Alvis, Butler. Ray Howerton, Ashley, and Oliver Taetz, Gray Summit, not shown in photograph

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the *Personal Side* of the news

Association President

W. S. (STEVE) WESTON, JR., recently elected president of The Weston & Brooker Co., Columbia, S. C., has been elected president of the National

W. S. Weston, Jr.

Crushed Stone Association. Mr. Weston is probably one of the youngest if not the youngest president of a national trade association. Soon after graduating in 1938 with a B.S. degree in physics from The Citadel, a military college in South Carolina, he became associated with the Weston & Brooker Co. as a quarry foreman. Subsequently he became assistant superintendent in charge of production and then assistant to the president. Mr. Weston was made a director of the company in 1939. During the war he served as Battery Commander for the 459th Anti-Aircraft Automatic Weapons Battalion of the 19th Corps, being attached to the 29th Infantry Division through five campaigns in Europe. Among his decorations are the Croix de Guerre with Palm, Silver Star, Bronze Star, and Purple Heart. He was released from the Army with the rank of Major. Mr. Weston rejoined the company in 1946 as vice-president and assistant general manager. At the death of his father, W. S. Weston, Sr., in October, 1947, he was chosen to succeed him as president of the company.

Associate Professor

JAMES A. MURRAY, director of research for the Warner Co., Philadelphia, Penn., since 1930 has been appointed associate professor of materials in the department of building engineering and construction at the Massachusetts Institute of Technology. He will take charge of the masonry materials research laboratory. Prof. Murray graduated from Harvard University in 1924 with the degree of bachelor of science in industrial chemistry. From 1924 to 1926 he held technical positions with the Naugatuck Chemical Co., the New Departure Mfg. Co., and M. W. Carr Co. In March, 1926, he joined the staff of the National Bureau of Standards in Washington, serving as a junior chemist in the lime and gypsum section of the building materials division, subsequently becoming chief of the section. Prof. Murray is a member of the American Society for Testing Materials, having served as vice-chairman of Committee C-7 on Lime. His place on this committee has been taken by Elmer E. Eakins, consulting technologist, Pure Lime Corp., Berwick, Penn.

Marble Cliff Elections

RUSSELL RAREY has been elected president of The Marble Cliff Quarries Co., Columbus, Ohio. HAROLD J. KAUFMAN has been named chairman

Russell Rarey

of the board of directors, succeeding W. H. Hoagland who has retired from active service but retains his place on the board. E. J. KAUFMAN has been elected vice-president, R. H. PAUSCH, secretary-treasurer, and U. C. KAUFMAN, assistant treasurer. Messrs. H. J. Kaufman, Russell Rarey, Stephen Stepanian, E. J. Kaufman, R. H. Pausch, W. H. Hoagland and F. A. Miller comprise the new board of directors.

Discusses Soils

DR. WILLIAM A. ALBRECHT, head of the Soils Department, University of Missouri, discusses the story of soil and its relationship to the health and well being of people in a new motion picture entitled "The Other Side of the Fence." This 16 mm. Kodachrome sound motion picture is produced and released by the Phillips Petroleum Co., Bartlesville, Okla., and is offered for showing to any group or organization interested in this subject. Requests should be addressed to the editor of PhilFarmer, house organ of the company.

Celotex Appointments

GILBERT J. HAAN has been named assistant vice-president of The Celotex Corp., Chicago, Ill. He will assist C. G. Muench, vice-president in charge of engineering. WILLIAM M. MCNEIL has been appointed production manager of the gypsum and mineral wool division, with headquarters in Chicago. He will have supervision over the plants at Hamlin, Texas; Port Clinton, Ohio; Lagro, Ind.; and Detroit, Mich. M. C. OLSON, acting manager of the roofing allied products sales department, has been appointed manager of that department.

Heads Concrete Firm

A. V. JOHNSON has been appointed president of the Ideal Cement Stone Co., Omaha, Nebr. He succeeds Charles Peterson, who retired recently. EARL W. PETERSON, son of one of the founders of the company, was elected vice-president and will continue as secretary.

Elected President

FRANK B. THACHER has been named president of The Carbon Limestone Co., Youngstown, Ohio, to fill the vacancy made by the retirement of F. O. Earnshaw. Mr. Thacher was formerly general manager of the Great Lakes Carbon Corp., Electrode Division, Niagara Falls, N. Y.

Frank B. Thacher

Assists Vice-President

AUWELL FOGARTY has been appointed assistant to F. T. Wiggins, vice-president, Western Region, Universal Atlas Cement Co., Chicago, Ill. Mr. Fogarty joined the company in 1939 as a clerk in the Chicago office and became a salesman in the Des Moines territory in 1940. After three years of service in the U. S. Navy he rejoined the company as a salesman in the Metropolitan Chicago territory. MELVIN L. KURTZ, formerly chief clerk in the Chicago office, has been appointed assistant sales manager.

Joins Manufacturers

CLARENCE E. EHLE, formerly president of the Indiana Limestone Co., Bedford, Ind., has joined the Stearns Manufacturing Co., Adrian, Mich., where he will devote most of his time to the development and installation of plants for the production of the new lightweight concrete aggregate known as "Sinterlite." Mr. Ehle has had wide experience in the concrete and concrete products field. His own concrete block plant was merged with other companies about 25 years ago to form The Cleveland Builders Supply Co. In 1945, Mr. Ehle joined the Indiana Limestone Co., Bedford, Ind., as executive vice-president, later becoming president. Several months ago, he resigned that position to rejoin the concrete industry.

Managing Director

EDWARD R. MURPHY, formerly assistant chief engineer of the Gypsum Association, Chicago, Ill., has been appointed managing director of the Vermiculite Research Institute, Evanston, Ill., which will now be known as the Vermiculite Institute. Mr. Murphy succeeds Vilas E. Watts, who is opening his own research laboratory in Palo Alto, Calif. The Vermiculite Institute will no longer be primarily concerned with research, but with the promotion of the use of vermiculite products nationally, cooperation with allied industries in the construction field, and the preparation of new literature and publicity.

Edward R. Murphy

Lehigh Personnel

RAYMOND R. BEAR has retired as vice-president and general manager of Lehigh Portland Cement Co., Allentown, Penn., concluding 50 years of continuous service with the company. An item concerning the tribute paid him for his many years of service appeared in the January issue of ROCK PRODUCTS. Mr. Bear will continue as a director of the company. JOSEPH C. PEARSON has retired as director of research and will be succeeded by WALTER J. MCCOY, manager of the research laboratory. Mr. Pearson went to Lehigh in 1924 from the U. S. Bureau of Standards where he had been engaged in cement and concrete research. He has gained national recognition as an authority in his field and is a past president of the American Concrete Institute as well as a long-time member of Committees C-1 and C-9 of the American Society for Testing Materials. Mr. McCoy, after graduating from Eau Claire State Teachers College, earned a Master's degree at the University of Minnesota. He entered the laboratory in 1938 as research chemist. JAMES A. GISH, JR., plant manager of the Sandt's Eddy plant, has also retired. Mr. Gish was the first superintendent of this plant, having gone there at the time of its construction, from the Bath plant. GEORGE W. HANNAMAN has been named plant manager to succeed Mr. Gish. Mr. Hannaman is a graduate of Iowa State College and was employed by Lehigh as a draftsman at the Mason City plant in 1937. Prior to going to Sandt's Eddy, he was assistant plant manager at Mason City, Iowa.

Raymond Bear

In the engineering department, T. W. SHIELDS has retired as chief draftsman, after 44 years of service. POUL B. BUSCK has been appointed chief mechanical engineer. A graduate of the University of Maryland, he entered the cement industry at the former Tidewater plant at Union Bridge, Md., in 1922. Transferred to Allentown in 1927, he became assistant chief draftsman in 1931. ROBERT V. WRAY has been named chief maintenance engineer. Mr. Wray was graduated from the University of Durham, England, and had a broad industrial experience before joining Lehigh in 1937. JOHN R. LEINBACH has been promoted to chief electrical engineer from electrical engineer. He has been employed by Lehigh since 1926. FOSTER E. BENNER has advanced to assistant chief mechanical engineer from the position of mechanical engineer.

Walter J. McCoy

At the Buffalo, N. Y., plant, ROBERT E. JONES has been promoted from plant manager to assistant plant manager and supervising chemist. RICHARD W. WHEATON, formerly electrical engineer, has been advanced to maintenance engineer.

GERALD W. BUSS has been appointed chief clerk at the Iola, Kans., plant where he has been assistant chief clerk. Mr. Buss succeeds C. E. Russell, who was employed at this plant in 1917 and became chief clerk in 1918.

Old-Timer Retires

FRED O. EARNSHAW has retired as president of The Carbon Limestone Co., Youngstown, Ohio, after 30 years' service with the company and a lifetime spent in the stone business. He will be succeeded by FRANK B. THACHER, formerly with the Great Lakes Carbon Corp., Niagara Falls, N. Y. However, Mr. Earnshaw retains a place on the board of directors, and will continue to reside in his home at Hillsville, Penn., where the company's limestone quarries are located, just in case he is needed.

Mr. Earnshaw's family has been in the stone business for many years.

Fred O. Earnshaw

His grandfather operated a stone quarry in England, and his father, Ono Earnshaw, operated a quarry at Morris, Ill., where Mr. Earnshaw was born. After attending Wheaton, Ill., College and then the Chicago Business School, he worked for a time for Western Stone Co., Joliet, Ill. He and his father established the Earnshaw Stone Co. at Lemont, Ill., which was sold when his father died. He joined the France Stone Co., Sandusky, Ohio, as traveling superintendent in 1898, and the Carbon Limestone Co. in 1918 as superintendent of the Hillsville quarry. When Robert Bentley, then president of Carbon Limestone Co., died 20 years ago, he was made president.

Mr. Earnshaw has been most progressive in new ideas for the industry; designed and built the first doorless power dump quarry car, and the wagon drill, now used extensively. He was the first quarry man to use the large overcasting stripping shovel, a 200-ft. boom dragline, for moving upwards of 70 ft. of overburden to uncover 18 to 21 ft. of stone.

Mr. Earnshaw is president emeritus of the Pennsylvania Stone Producers Association and past president of the National Crushed Stone Association, of which he is still a director.

National Gypsum Elections

LEWIS E. SANDERSON, superintendent of construction, National Gypsum Co., Buffalo, N. Y., has been named vice-president in charge of operations. Mr. Sanderson succeeds GORDON H. TARBELL, who has reached retirement age. Mr. Tarbell, one of the company's founders, continues as a director and in an advisory capacity on production. DEAN D. CRANDELL, who has been director of product research, is now vice-president in charge of sales and advertising. CHARLES E. MASTERS, controller, has been promoted to the new position of vice-president in charge of accounts. FRANK L. MARSHALL, assistant director of research, succeeds Mr. Crandell as director of research. FRED A. MANSKE, divisional production manager, has been named general production manager in charge of all manufacturing.

Association President

PAUL B. CONAWAY, vice-president and treasurer of Brewer & Brewer Sons, Inc., Chillicothe, Ohio, has been elected president of the Ohio Sand and Gravel Association. Mr. Conaway, who has been vice-president of the association for two years, succeeds William E. Hole of Greenville, who has served as president for 12 years.

Mineral Technologist

ALLAN M. SHORT, formerly mineral technologist for the Missouri Pacific Lines, has started private practice as geologist and mineral technologist specializing in industrial raw materials. His office is located in the Arcade Building, St. Louis, Mo.

Wayne Geiger, George Thornton, Ottawa Silica Co., and R. S. Lebold, Michigan Silica Co., guests at National Crushed Stone Association convention

OBITUARIES

HARVEY L. KNAPPENBERGER, retired vice-president and sales manager of the Oregon Portland Cement Co., Portland, Ore., died recently at the age of 61. Mr. Knappenberger was active in the cement business in Pennsylvania, Illinois and British Columbia, and in 1922 supervised the construction of the Sun Portland Cement Co. plant at Lime, Ore. When the company merged with the Oregon Portland Cement Co., Mr. Knappenberger became secretary-treasurer. When he retired in 1941 he was vice-president and sales manager.

JOSEPH F. BURKE, former owner of the Asphaltic Concrete Corp., Plainfield, N. J., the Eastern Sand and Gravel Co., Philadelphia, Penn., and the Eastern Asphalt Co., died recently at his home in Plainfield. He was 67 years old. Mr. Burke founded the Joseph F. Burke Co., a construction firm, which he sold in 1944.

HENRY SCOTT THOMAS, retired quarry operator at Charlottesville, Va., died January 1 at the age of 77.

ALBERT E. BLACK, president of the Black Masonry and Contracting Co., St. Louis, Mo., died January 12. He was 66 years of age.

EDWIN P. LUCAS, president of the Superior Portland Cement Co., Seattle, Wash., passed away January 19 in La Jolla, Calif., after an illness of several months.

WILLIAM J. HAMILTON, secretary and a director of the Hendrick Manufacturing Co., Carbondale, Penn., died January 27 after a long illness. He was 80 years of age.

M. D. COLLINSON, quarry operator and road contractor of Moline, Ill., died recently. He was 42 years old.

CHARLES BAUMBERGER, SR., president of the San Antonio Portland Cement Co., San Antonio, Texas, died unexpectedly on January 15. He was 84 years old.

JOHN WESLEY HOOPER, retired sales manager of the St. Louis, Mo., district of the Lone Star Cement Corp., New York, N. Y., died January 21 at his home in Kansas City, Mo. He was 65 years of age and had been associated with the company since 1923.

REGINALD K. NEILL, chairman of the board of the Spokane Portland Cement Co., Spokane, Wash., died suddenly on January 25 as he was entering a taxicab in front of the Spokane Club, where he resided. He was 85 years old. Mr. Neill had been associated with the company since 1920 and was president until 1940 when he became chairman of the board.

JAMES G. PARKER, for ten years associated with Buffalo Sand Co., Inc., Buffalo, N. Y., as sales manager, died on his 63rd birthday after an illness of seven weeks. He is survived by wife and two sons.

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INDUSTRY *news*

Cement Companies Consolidate

THREE FORKS PORTLAND CEMENT Co., Three Forks, Mont., has been consolidated with other subsidiaries, according to company officials, and now is known as the Ideal Cement Co. The cement and plaster plants at Trident and Hanover had been wholly owned by the Ideal Co. since 1924. The Three Forks Co. was dissolved and the cement products are being marketed under the brand "Ideal." Plaster products, however, will continue to be marked "Hanover."

$3,000,000 Phosphate Plant Proposed

EMPIRE CHEMICAL CORPORATION, Washington, has announced plans for immediate construction of two superphosphate fertilizer plants near Colville, Wash. William Anderson, manager of the corporation, estimated the new industry at $3,000,000, and said Empire believes it can produce and ship economically to 21 states as well as supplying local farm needs, and give the benefit of phosphate fertilizer to a potential market of 2,500,000 farms.

Producing Sand and Gravel

D. W. OVEROCKER crushing plant, Burlington, Vt., is producing sand and gravel at the rate of 1000 tons per 10-hr. day, using Diesel power. Two "Caterpillar" Diesel D8800 engines drive crushers, screens and washers, and a "Caterpillar" Diesel D3400 engine drives the pump used to supply water for the screening and washing processes. At the stockpiles, a Koehring No. 303 shovel, powered by a "Caterpillar" Diesel D4600 engine, loads out sand and gravel for distribution to work sites by truck.

Nonmetallic Minerals Production

TOTAL VALUE of nonmetallic minerals produced in 1947 was $1,600,000,000, or 22 per cent more than in 1946, according to the Bureau of Mines. The most outstanding increases were made in building materials, while record production in quantity as well as value, was attained in sulfur, potash, phosphate rock, boron, feldspar, kaolin, stone, cement, and vermiculite.

In the building materials industry, clay products more than doubled the 1946 output. Cement production rose from 167,000,000 bbls. in 1946 to approximately 188,000,000 in 1947, an increase of 13 per cent. Sand and gravel, used chiefly as aggregates, increased about 8 per cent to 275,000,000 short tons. Total stone production, exclusive of that used in making cement and lime, was estimated at about 200,000,000 short tons, a new record. Output of gypsum products rose 7 per cent.

Domestic output of potash, used in fertilizers, exceeded 1,000,000 short tons in 1947. Phosphate rock attained a record of over 9,000,000 short tons. Production of nitrogen increased to 1,300,000 short tons.

Industrial demand for soda ash and other salt products was so great as to increase production to 15,000,000 short tons last year. Production of native sulfur reached 4,825,000 long tons, and output of pyrites increased to 825,000 long tons. Production of barite totaled approximately 720,000 short tons. Shipments of fluorspar established a peacetime record approximating 330,000 short tons.

Gypsum Mill Expansion

PLANS for the expansion of National Gypsum Co.'s Medicine Lodge plant, Medicine Lodge, Kan., are now being laid, according to Dudley C. Chads, manager. New electrical equipment and machinery will be installed first. Production at the plant already has been increased with the use of a third rotary kiln.

Increase Illinois Freight Rates

ILLINOIS RAILROADS have been authorized by the state commerce commission to temporarily increase freight rates within the state 10 per cent on sand, gravel, crushed stone and related materials. The interstate commerce commission recently approved emergency interstate freight rate boosts of 20 per cent on the same materials.

Rock Wool Plans Delayed

PLANS for the production of commercial rock wool for insulation purposes have been delayed in Saskatchewan, Montreal, Canada, because only insufficient quantities of the correct type of limestone have been discovered, according to C. A. L. Hogg, Saskatchewan's Deputy Resources Minister. However, government tests in the Estevan area of southeastern Saskatchewan showed that high quality rock wool could be made from the province's shale and limestone deposits.

Purchase Sand-Gravel Firm

NEW LONDON SAND and Gravel Co., Wilmar, Minn., recently was purchased by a group headed by E. W. Hallet, Crosby, Minn., and J. A. Woodhall, Glenwood, Minn. Mr. Hallet operates several concrete aggregate plants as well as construction firms and mining companies in the Mid-West. Mr. Woodhall has been associated with the Hallet interests for 10 years, and since his release from the navy has been general superintendent of the construction division of Central States Construction Co. The sand and gravel firm will continue to operate under the same name.

Road Building Costs Rise

ROAD CONSTRUCTION costs to date have risen 80 to 93 per cent above 1940 costs, according to the American Public Works Association, thus creating a major financial problem at the time when motor vehicle registration in 1947 is estimated to have set an all-time record of 32 million, approximately 3.2 million more than in 1946. In addition 1947 truck registration at 6.5 million is an increase of more than 13 per cent over 1946 figures. However, approximately 895 million in contract awards were authorized by the states last year to meet the need for highway improvement, and work began on urban expressways and multilane rural highways in California, Connecticut, District of Columbia, Florida, New Jersey, New York, Ohio, Pennsylvania, and Texas.

Bids Opened for Levee Construction

BIDS HAVE been opened for construction of 515,000 cu. yds. of levee embankment on the West Atchafalaya and Butte La Rose levees in St. Martin parish, and for construction of 1,575,000 cu. yds. of hydraulic base fill and 145,000 cu. yds. of uncompacted Type 3 fill on the West Atchafalaya and Wax Lake West levees in St. Mary parish, near New Orleans, La.

Granted $500,000 Contract

BLAW-KNOX Co., Pittsburgh, Penn., has announced receipt of a $500,000 contract for the engineering and construction of new facilities at the Mobile, Ala., plant of the National Gypsum Co. The chemical plants division of Blaw-Knox will handle the project which covers the installation of new equipment, improvements in processing, and modernization of buildings.

Ohio Sand-Gravel Luncheon

ON JANUARY 20th the Ohio Sand and Gravel Association held its annual business meeting and election of officers for the coming year. The treasurer's report for the preceding year was read by Stephen Stepanian, Arrow Sand & Gravel Co., Columbus, Ohio, followed by Claude Clarke's executive secretary's report of work accomplished over the past year. Mr. Clarke's report covered a review of state legislative acts affecting the members' business; probable effects of the increased accident rate on insurance rates; and the effect of the new state sales tax. Also mentioned was the association's new "used equipment market"; and indications that point to a good year ahead.

Former President W. E. Hole, American Aggregates Corp., Greenville, Ohio, gave a challenging farewell address based on what he saw ahead as problems for the association from his vantage point of 12 years in office.

Final business at the meeting was election of officers and new members to the board of directors. New officers are: Paul Conaway, Brewer & Brewer Sons, Inc., Chillicothe, Ohio, president; C. W. Purdy, Killbuck Sand & Gravel Co., Killbuck, Ohio, vice-president; J. H. Evans, Sturm-Dillard Co., Columbus, Ohio, treasurer; and Claude Clarke, executive secretary. New members elected to the board were: J. E. Martin, Enon Sand & Gravel Co., Enon; W. P. Green, Wapak Sand & Gravel Co., Lima; C. E. Glander, American Aggregates Corp., Greenville; Walter Penry, Penry Sand & Gravel Co., Radnor; and G. R. Fuller, Portsmouth Sand & Gravel Co., Portsmouth.

State Cement Plant To Double Capacity

SOUTH DAKOTA STATE CEMENT PLANT, which already has increased production from a pre-war average of 450,000 bbl. per year to 650,000 bbl. for 1947, has announced that additional equipment, now on order, will boost cement production to approximately 900,000 bbl. by 1949, a 100 per cent increase over prewar figures. Improvements being made at the present time will raise the plant's production to 825,000 bbl. this year, it was estimated.

Sink Fluorspar Shaft

DELHI FLUORSPAR CORP., has announced the completed sinking of a new 200-ft. shaft at Hickory Cane fluorspar mine near Marion, Ky.

Purchase Quarries

HAROLD EYRICH and Mr. Saathoff recently purchased the Tobin quarries at Guernsey, Wyo., now known as the Guernsey quarries.

New officers of the Ohio Sand and Gravel Association. Left to right: J. H. Evans, Sturm and Dillard, treasurer; C. W. Purdy, Killbuck Sand and Gravel Co., vice-president; and Paul Conway, Brewer & Brewer Co., president; and Claude Clarke, secretary

Reduce Jackhammer Injuries

ONE of the principal sources of accidental injuries in quarries is jackhammer operation, according to an Industrial Data sheet recently issued by the National Safety Council. In order to prevent hazard, operators should be provided with suitable equipment and machines should be kept in good condition, the sheet states, listing seven ways to insure safety while on the job, some of which are: thoroughly examine the slope and face for loose rock; watch footing when climbing; keep a good grip, drill with feet apart, and collar holes at low speed; and observe all precautions in blasting. Copies of the sheet, entitled "Jackhammers in Quarries" may be obtained by writing the National Safety Council, 20 North Wacker Drive, Chicago 6, Ill.

Acquire Silica Gel Plant

DAVISON CHEMICAL CORP., Curtis Bay, Md., has recently acquired a silica gel plant from the War Assets Administration.

Barite Survey

NORTH CAROLINA AND SOUTH CAROLINA state geologic departments are cooperating with the Tennessee Valley Authority in an inventory survey of the Kings Mountain, S. C., barite deposits.

Coming Conventions

March 1-3, 1948—
National Concrete Masonry Association, Annual Meeting, Hotel New Yorker, New York, N. Y.

March 1-5, 1948—
American Society for Testing Materials, Committee Week and Spring Meeting, Washington, D. C.

March 11-13, 1948—
American Concrete Pipe Association, 40th Annual Convention, Hotel Roosevelt, New Orleans, La.

April 5-7, 1948—
National Lime Association, Operating Division, Gibson Hotel, Cincinnati, Ohio, January 29-30, 1948; Annual Convention, The Homestead, Hot Springs, Va.

June 21-25, 1948—
American Society for Testing Materials, Annual Meeting and Exhibit of Testing Apparatus and Related Equipment, Book - Cadillac Hotel, Detroit, Mich.

July 16-24, 1948—
American Road Builders' Association, Exposition of new Construction Equipment, Soldier Field, Chicago, Ill.

October 20-22, 1948—
National Industrial Sand Association, Annual Meeting, The Homestead, Hot Springs, Va., May 12-14, 1948; Semi-Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

Cover Picture

ON the cover of this issue of ROCK PRODUCTS is shown a very unusual blasting picture. It shows a four-blast hole shot bringing down 30,000 tons of trap rock at Haverstraw quarry, New York Trap Rock Corporation. Holes were 9 in., loaded with a total of 7000 lbs. of explosive, and fired by split second delay shooting, from left to right. The face was 160 ft., burden 22 ft., and the spacing 24 ft. Holes were drilled to 5 ft. below quarry floor to minimize toes. Note the churning, breaking effect as rock is crumbled as it falls.

Missouri Limestone Use

MORE THAN 3 million tons of agricultural limestone were spread on Missouri farms in 1947, according to the Agricultural Extension Service. This figure includes lime purchased through the federal farm program and cash lime. The tonnage is the largest for one year in Missouri history, and is about a half million tons in excess of last year's production, which was the largest production year to 1947.

Low Grade Barite Ore Recovery Research

LABORATORY TESTS are being run by Clinchfield Sand and Feldspar Co., Baltimore, Md., to develop processing methods for economical recovery of barite from low grade ores in the Kings Mountain, S. C., area. The company has a processing plant at Kings Creek, S. C., but ore used is transported from Tennessee. Previously the Kings Mountain deposits have yielded barite only by hand picking.

Gravel from River Channel

ESTEY SAND & GRAVEL CO., Troy, Ohio, recently removed gravel from the Miami river for the two purposes of channel improvement and foundation aggregate for the new Troy Sunshade Co. factory. Work was overseen by the Miami Conservation District engineers.

Stone Company Sold

NASHVILLE CRUSHED STONE CO., Nashville, Tenn., forced to stop operations because of zoning laws, has been sold for $100,000. Ralph Rogers, Harry L. Berry and Ben Woodard were the former owners of the 275 acres of property.

Fluorite Ore Tests

WITH FLUORSPAR in increasing demand during World War II, the Bureau of Mines conducted many wartime metallurgical tests at the Salt Lake City, Utah, station, on samples of western fluorite ores to determine their suitability for industrial use. Publication of these reports was not practical during the war, but they are now being released to the public. Two of these reports are as follows:

Report of Investigation No. 4133, "Concentration of Fluorite Ores From Arizona, California, Idaho, Montana, Nevada and Wyoming." After examining fluorite deposits in six Western states, the Bureau tested samples from 12 deposits located in Gila, Yuma and Greenlee Counties, Ariz.; San Bernardino County, Calif.; Lemhi and Custer Counties, Idaho; Liberty County, Mont.; Nye and Pershing Counties, Nev.; and Crook County, Wyo. Acid-grade fluorspar concentrates, with good recoveries, were produced from only four ores. However, all samples were amenable to the production of concentrates meeting chemical specifications for metallurgical-grade fluorspar.

Report of Investigation No. 4139, "Concentration of Colorado Fluorite Ores." From 1943 to 1945 the Bureau investigated and sampled numerous fluorite deposits in Colorado, with samples being tested from Boulder, Chaffee, Jackson, El Paso, Park, and Gunnison Counties. In general, the close mixture of fluorite and gangue in these samples prevented production of metallurgical-grade fluorspar by gravity concentration methods. Nevertheless, several ores proved amenable to concentration by flotation methods. Concentrates were produced containing over 98 per cent calcium fluoride and marketable as acid-grade fluorspar. More than 80 per cent of the fluorite was recovered in tests.

Copies of either of these reports may be obtained free from the Bureau of Mines, 4800 Forbes St., Pittsburgh, Penn. The publication desired must be identified by title and number.

Wyoming Granite Deposits

GRANITE IS AVAILABLE in the Rawhide Buttes area of Niobrara County, Wyo., in sufficiently large pieces to work economically, according to an industrial engineer's report. Lake Harris, president, Jay Em Stone and Gem Corp., Lusk, and other Lusk business men are considering developing these granite deposits. Rawhide Butte is considered one massive block of granite.

LIME CONVENTION PROGRAM

THE HOMESTEAD, Hot Springs, Va., will be the site for the 30th Annual Convention of the National Lime Association and the 46th Annual Meeting of the Lime Industry, April 5-7.

The program will open at 10:00 a.m. on Monday, April 5, with H. D. Brigstocke, chairman of the Board, calling the meeting to order. Minutes of the Annual Meeting, 1947, and the Association Financial report will be read, followed by appointment of committees and a report on election of directors.

The general session will get underway at 10:30 a.m. with the general manager's report by Robert S. Boynton. Abram F. Myers, counsel, Washington, D. C., will speak on "Current Legislation and Court Decisions," after which Walter J. Murphy, editor of Industrial and Engineering Chemistry, Washington, D. C., will be heard. The newly elected board of directors will meet in the afternoon. The Association Bingo Party with special gifts for the ladies is scheduled for the evening.

Discussion of the association budget for the fiscal year will open the Tuesday session. Reports of committees will be given, and Roma M. Turpen, secretary, will make the safety announcement. Ratification of officers for 1948-49 will take place.

The Trade Waste-Construction Session will follow, featuring speakers C. E. Schwob, Sanitary Engineering Director, U. S. Public Health Service, Washington, D. C., on "Federal and State Stream Pollution Legislation"; E. F. Eldridge, Professor of Sanitary Engineering, Michigan State University, Lansing, Mich., on "Industrial Waste Treatment"; Chester McDowell, Senior Soils Engineer, Texas Highway Department, Austin, Texas, on "Lime—Soil Stabilization in Texas"; and Sverre Fjeldstad, engineer, Ytong Stabilite Co., Sweden, on "Building Lime in Sweden." Mr. Fjeldstad will supplement his talk with movies on "Ytong and Stabilite" (Swedish lightweight building blocks). The annual Association banquet, entertainment and dance will be held that evening.

Wednesday will feature the Research Session, with Professor Walter C. Voss, Head of Building Engineering and Construction, Massachusetts Institute of Technology, Cambridge, Mass., presiding. Topics to be discussed include: the Agricultural Fellowship Report by Dr. Garth W. Volk, chairman, Department of Agronomy, Ohio State University, Columbus, Ohio; Trade Waste Fellowship Report by Dr. Willem Rudolfs, professor, department of Water Supply and Sewage Disposal, Rutgers University, New Brunswick, N. J.; "Road Stabilization" by A. W. Johnson, Field Engineer, Highway Research Board, Washington, D. C.; report on Fundamental Lime Research Fellowship by associate professor James A. Murray, Massachusetts Institute of Technology, Cambridge, Mass.; and "The Control of Corrosion by the Use of Lime" by Edward S. Hopkins, Associate Engineer, Bureau of Water Supply, Baltimore, Md.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Steep Conveyor

THE SUTHERLAND READY-MIX CO., Pullman, Wash., has a Noble batching plant with two inclined belt conveyors

Conveyor belt installed at a 28 deg. angle

to move aggregates into the bins. These belts were originally installed at an angle of 32 deg., but that proved too steep so they were gradually lowered until an operateable point was reached. This was finally determined at 28 deg. Even at this grade the gravel had to be dampened to help prevent roll-back. The Republic belts are not ribbed and operate at nominal speeds. Side-boards have been installed along the entire length of the belt. This 28 deg. grade probably sets a record for conveyor belts, particularly handling this type of material.

Turntable for Block Plant

AT the new block plant of Western Pumistone Products Co., San Carlos, Calif., the masonry units removed from the No. 9 Stearns Joltcrete are placed on racks in front of the machine. The turntable is located in the floor immediately in front of the block machine, permitting the operator to turn the rack to facilitate the off-bearing operation.

Empty steel racks are wheeled onto the turntable by means of a Scoopmobile. There are turntables on the market for this purpose, but deliveries could not be had in time so E. H. Judd, general manager, made his own. As it cost about $300, no great saving was obtained over the standard turntable, but he did get what he wanted, when he wanted it.

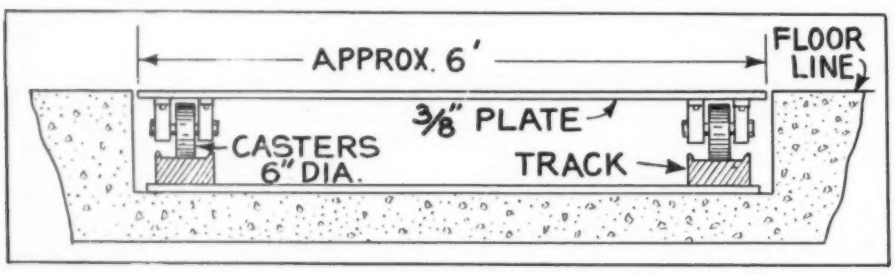
As shown in the illustration, the circular plate has four casters on which to ride over a circular track. The assembly is in a shallow pit so that the top plate is flush with the concrete floor.

Loading Roof Slabs

THE FORMIGLI CORPORATION, Berlin, N. J., specializes in the manufacture of Channelcrete roof slabs, joists, beams, etc., and just recently installed a 40-ft. Lithibar machine, said to be the longest machine installed to date. For loading the structural units the company uses a series of roller conveyor sections that can be extended from the ground line to the back end

Loading concrete roof slabs on semi-trailer with the aid of roller conveyor sections

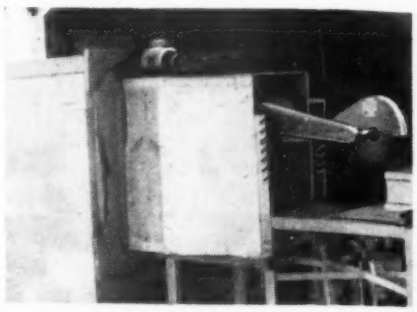
of the semi-trailers, as shown in the illustration. The shorter lengths are loaded at right angles to the long axis of the truck. By using semi-trailers for haulage, the trucks can be loaded at any convenient time with any extra labor that happens to be footloose.



Cross section details of turntable for block plant

Masonry Saw Dust Arrestor

CRESCENT CONCRETE PRODUCTS CO., New Orleans, La., built a dust arrestor system to eliminate dust created



Above: Close-up view showing saw and fan box in place against baffle box. Below: Close-up of saw in action. Note stream of dust being drawn into fan box

in sawing block. The baffle box, approximately 4- x 6- x 8-ft., is built of concrete block with a precast lightweight slab roof, and contains a circular water spray resembling an ordinary bath spray.

As shown in the illustration, the table that mounts a Clipper Masonry Saw also supports a 2½-ft. square box containing a large suction fan. Dust from the cutting operation is sucked from the saw and introduced into the baffle box, the first section of which contains the spray previously mentioned. The joint between the fan box and the concrete baffle box is made dust proof by means of heavy padding.

Electric Heat for Asphalt Plant

THE CITY OF LOS ANGELES recently completed a 150 t.p.h. asphalt plant which was installed by Standard Steel Corporation at an approximate cost of $325,000. The city operates two additional asphalt plants with a combined capacity of about half that of

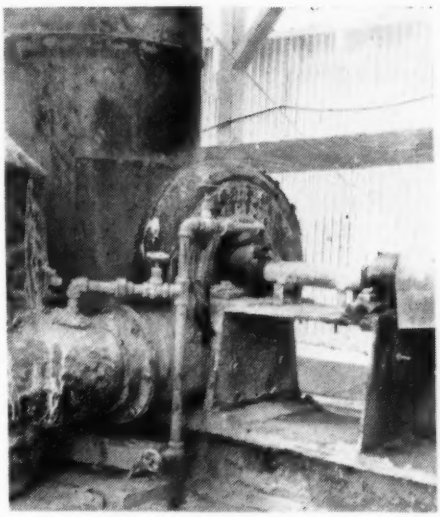
the new plant in order to mainain 2358 miles of asphaltic concrete streets in the city limits. This is one of few plants where all heating of materials, except for aggregate drying, is done electrically. The conical firebox for the 7- x 30-ft. dryer is built to revolve, minimizing wear on the top. It is fitted to burn either natural gas or compressed air atomized fuel oil.

A seven compartment aggregate bunker, 28- x 153-ft., with 1000-ton capacity, is constructed of 12-in. reinforced concrete and extends 11-ft. below ground level. Aggregate is elevated to a double deck 4- x 14-ft. Symons vibrating screen. Materials are weigh batched by a Kron scale. Dust collection by a cyclone, multiclone and spray chamber attains an efficiency of 99.9 per cent handling 30,000 c.f.p.m. (atmospheric pressure) at 350 deg. F. Dust recovered by the first two collectors is transferred to a 3-ton storage bin, from which it is conveyed to the aggregate weigh box by a fully enclosed helical screw.

Concrete Ramp

AT an operation in the East, a fleet of Dumptors deliver the rock to the 36- x 48-in. Buchanan jaw crusher. The crushing plant rests on the side of a hill, and some advantage is taken of gravity but for the most part the primary crusher can be said to be at ground level. A dirt ramp has been built for most of the rise to the primary feeder with the last section of reinforced concrete. Judging from the illustration the form for this concrete section comprised sections of corrugated steel pipe which give the lower section the beamed structure which is not only novel, but quite practical.

Sections of corrugated steel pipe serve as forms in building concrete ramp



Kettle collectors "corral" dust at gypsum plant

Kettle Dust Collectors

As the Long Beach, Calif., plant of Standard Gypsum Co., is in the industrial section and close to the resort area, dust from the calcining kettles must be "corralled."

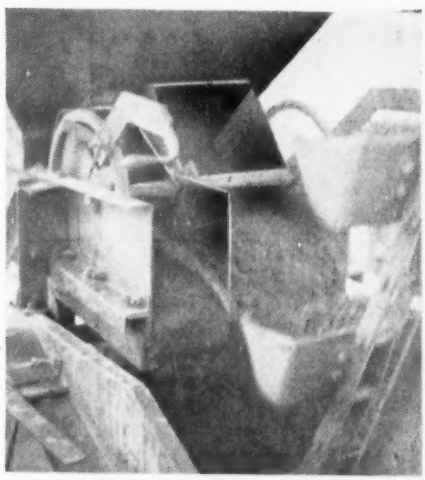
When the plant started about 20 years ago, the dust collectors now in use, one on each of the three Ehrsam kettles, were installed. When it was realized by these operators that so-called dust from a kettle is not really dust at all but only fine mud in suspension, the problem was simple and was solved comparatively easy. The 6-in. high-speed fans exhaust the hot gases from the old stack and blow them into a small dust collector which is about 4 ft. in diameter. One water spray goes on to the blades of the fan at a tangent and keeps the blades clean while the second spray is in the discharge pipe of the fan just before it enters the dust collector. That's all there is to it. The spray waters wash off the fine mud particles that splatter on the inside of the collectors and wash the residue to waste.

Water impinging on the fan blades causes wear so the fan assembly is made up for quick replacements of the blades. The latter are also hard surfaced.

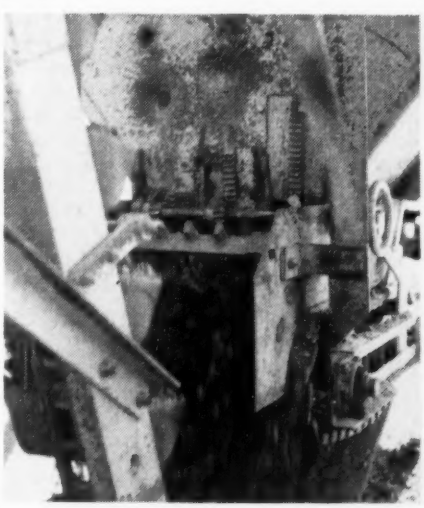
Multi-Purpose Belt Conveyor

RECENTLY in the Northwest, a single belt conveyor installation was observed which carried two different sizes of crushed stone at the same time under unusual conditions. Producers in the rock products field operating hot top plants are familiar with the use of a single reciprocating pan feeder to feed sand, coarse aggregate, and mineral filler, but this practice has never been observed in any other phase of the industry and a description of two types of this feeder is therefore being given.

No. 1 uses a quadrant type gate to feed two products and No. 2 uses vertical rack and pinion gates to adjust the flow of three different materials. The amount of material fed, in all cases is gauged by the size of the feed opening. On No. 1 the flow is helped to uniformity by electric vibrators; in No. 2, a small apron feeder takes the place of the reciprocating type used in the case of No. 1.



Quadrant type gate (No. 1) is used to feed two products to conveyor



Vertical rack and pinion gates (No. 2) to adjust flow of three different materials

new MACHINERY

Test Car Shakeout

HEWITT-ROBINS, INC., Passaic, N. J., recently tested one of its 5-ton Robins Car Shakeout vibrating devices at the Inland Steel Co. plant at East Chi-

Vibrating car shakeout unloading a frozen carload of coal

cago, unloading hopper-bottom railroad cars. Vibrations of over 1000 impulses per minute empty a car, broom-clean, in from 2 to 5 min. The vibrating unit can unload a hopper-type car of frozen coal in 10 min., eliminating the former costly hand method requiring many men using sledge hammers, pickaxes and poke bars. This shakeout has been used very effectively for unloading damp stone sand, and also should find an application in unloading frozen carloads of lightweight aggregates and cinders for concrete block plants.

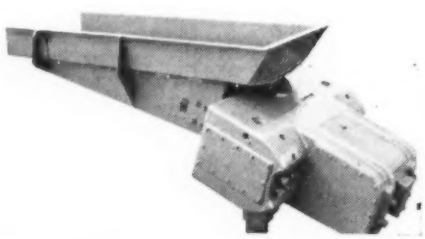
Adjustable Troughing Idler

KOPPERS CO., INC., Pittsburgh, Penn., has brought out an adjustable troughing idler which is said to increase the life of conveyor belts. Invented by P. J. Connors of the Engineering and Construction division of the company, the idler has outer inclined pulleys which are adjustable from slightly above the horizontal up to an angle of 25 deg. All idler pulleys are located in the same vertical plane and the adjustment of the outer pulleys is accomplished in a manner which maintains a constant gap between the ends of the horizontal and inclined pulleys. This gap is kept at a minimum to prevent creasing or pinching.

It is said that this design is particularly suited for use at locations where an inclined belt changes to a horizontal path. With this new idler design a suitable number of adjustable idlers are used to form a vertical curve and provide the shallowest depth of trough necessary to retain the material without spill. This shallow trough will also eliminate excessive belt stretch.

Vibrating Feeder

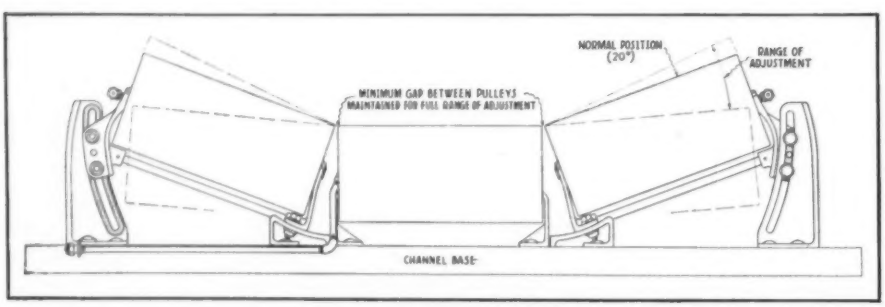
THE JEFFREY MANUFACTURING CO., Columbus, Ohio, has announced an electric vibrating feeder with an enclosed power unit. This unit was designed for use in installations where the material to be handled is magnetic, hot, dusty, and abrasive. Such installations have at times caused trouble because the hot magnetic dust would sift down on the open magnetic motor of the vibrating feeder or conveyor



Vibrating feeder with enclosed power unit

and cause serious damage to the coils and pole faces.

The enclosed vibratory power unit is said to be dust-tight, and is provided with air inlet and outlet features, permitting circulation of air through the motor and, if necessary, can build up a slight internal pressure to keep out dust.

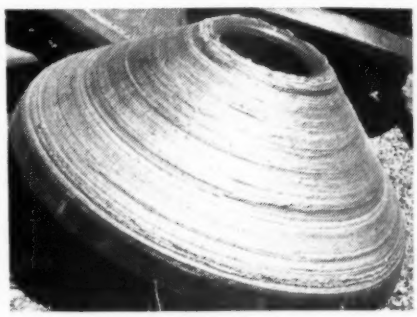

NORMAL POSITION (20°)
RANGE OF ADJUSTMENT
MINIMUM GAP BETWEEN PULLEYS MAINTAINED FOR FULL RANGE OF ADJUSTMENT
CHANNEL BASE

Troughing idler designed to reduce belt wear

Automatic Hard-Facing

STOODY CO., Whittier, Calif., has announced an automatic method of hard-facing made possible by the production of a tube in coil form suitable for hard-facing.

Materials for automatic hard-facing in coils are made in the form of continuous steel tubes containing various alloying elements. In order to produce a deposit with the required abrasion resistant qualities, hard-facing alloys must be relatively hard, with consequent brittleness as developed by the



Gyratory cone built up with 200 lbs. of hard-facing

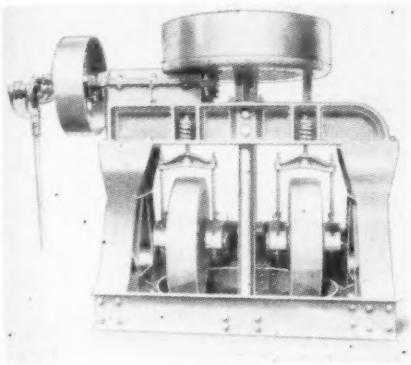
addition of varying quantities of elements such as chromium, molybdenum, tungsten, nickel, manganese, carbon, etc. As these metals are produced by casting in sand molds, it is not possible to produce them as a continuous flexible wire suitable for automatic welding. However, the tubular construction permits the production of materials of higher alloy content than are possible to obtain in a conventionally drawn wire, yet retaining the flexibility to permit coiling and unreeling during automatic welding.

The automatic hard-facing method has the following advantages, according to the manufacturer: (1) higher welding speed; (2) welding is continuous; (3) more uniform arc is obtained: (4) deposits are completely uniform; (5) surface appearance and smoothness is superior; (6) no hard-facing alloy is lost in stub ends; and (7) a highly experienced operator is not required.

Grinding Cinders

W. A. RIDDELL CORPORATION, Bucyrus, Ohio, has three models of grinders of the dry pan type which are coming into increasing use for grinding cinders used in concrete block manufacture. A substantial saving in power consumption is claimed for this type grinder and also in wear and tear. Models 418 and 482 resemble the dry pan, but the operation is different as there are no screen plates in the

bottom of the machine. The grinder is equipped with heavy mullers, but the rim of this type grinder is stationary and is set so as to leave a



Type of grinder being used to reduce cinders

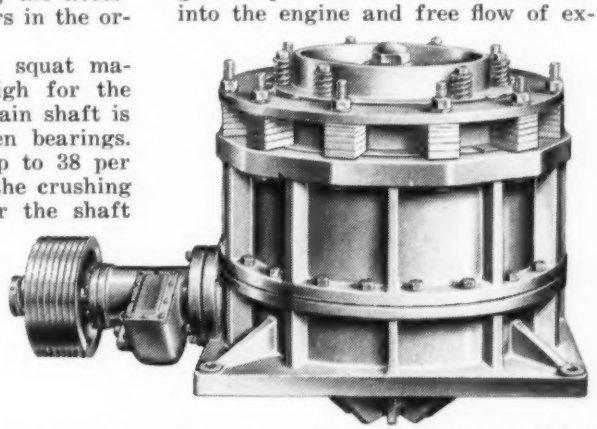
space between the revolving base and the underside of the rim. Material passing under the mullers is crushed and then discharged by centrifugal force off of the revolving base and through an opening under the stationary rim. The rim is adjustable to regulate the opening for the escape of the crushed material and this regulates the degree of fineness to which the material is ground. Model 339 is a 10-ft. dry pan in its largest size, but also is obtainable in smaller sizes down to 5-ft. pans.

This type of grinding equipment is more familiar to the silica sand industry where mullers have been used for many years for wet grinding.

Gyrating Cone Crusher

STRAUB MANUFACTURING CO., INC., Oakland, Calif., has developed the Gyracone, a gyrating cone swinging on the true apex of gyration. The manufacturer points out that it is designed to operate on the principle of "crushing without rubbing," reducing wear. Kue-Ken jaw crushers made by this company have operated on this principle for a number of years. Another feature claimed for the Gyracone is the ability to accept an unrestricted or "choke" feed, avoiding the necessity for mechanical feeders in the ordinary installation.

The crushers are low, squat machines, being 30¼-in. high for the 18-in. crusher, and the main shaft is exceptionally long between bearings. Shaft diameters range up to 38 per cent of the diameter of the crushing head. Large bearings for the shaft



Gyrating cone type crusher

assure low bearing pressures. Lubrication is positive, and is furnished by an integral gear type oil pump, forcing oil under pressure to all vital parts. The crusher is provided with an oil filter, oil tank, gauge and an automatic shutdown device against lubrication failure. A safety device in the driving pulley provides over-load protection against "tramp iron" or other uncrushable material. Crushing faces can be quickly and positively adjusted to regulate the size of the crushed product.

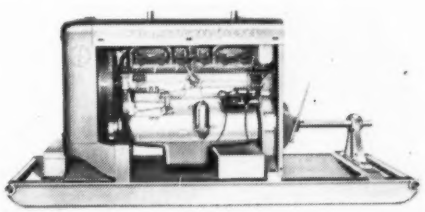
Increase Bearing Capacity

THE TIMKEN ROLLER BEARING CO., Canton, Ohio, announced through A. L. Bergstrom, vice-president in charge of engineering, that a 25 per cent increase in the radial and thrust load carrying capacities of its tapered roller bearings had been made possible through studies at its physical laboratory and in the field.

Large Diesel Engine

INTERNATIONAL HARVESTER CO., Chicago, Ill., is now in production on its 6-cyl., 1090-cu. in. displacement Diesel engine with a 5¾- x 7-in. bore and stroke, the UD-24. The engine is the largest and most powerful Diesel built by the company. The engine develops 191 hp. at 1375 r.p.m.

This unit is designed for heavy-duty operations such as the operation of construction machinery, crushers, and electric power plants. The same engine is used in the International TD-24 tractor. It is a four-cycle en-



Diesel engine designed for heavy-duty service

gine with twin-plunger fuel injection pump, and the IH pre-combustion chamber permitting the use of low cost fuels. Exhaust and intake manifolds are on opposite sides of the engine to provide free flow of cool air into the engine and free flow of exhaust gases from the engine. A 12-volt generator and electric starting motor are regular equipment and combine with the inbuilt gasoline-conversion starting system to get the engine into operation quickly.

Suction Sump Pump

GARDNER-DENVER CO., Quincy, Ill., has designed a sump pump, known as the VP-4, which is said to overcome

Top suction sump pump

a common cause of pump failure, the breaking of the pump shaft seal because of water pressure. It incorporates a new principle, "top suction," in which the oil seal is subjected only to static pressure from depth of immersion when the pump is not in operation. When the pump operates, water cannot reach the oil seal on the vane-type air motor.

Correction

NEW HOLLAND MANUFACTURING CO., Mountville, Penn., has called attention to an inaccurate caption appearing under a cut illustrating the Double Impeller Impact Breaker manufactured by this company which appeared on page 111 of the December issue. This caption incorrectly referred to the Double Impeller Impact Breaker as a hammermill type.

Welding Torch

THE AIR REDUCTION SALES CO., New York, N. Y., has announced the Airco 800, an oxyacetylene welding torch, which is said to be suitable for almost any welding job from the thinnest sheet metal up to 1½-in. thick.

Wire Rope Department

R. G. LETOURNEAU, INC., has created a wire rope sales department at its Peoria, Ill., plant. A full line of sizes, types and construction of preformed and non-preformed wire rope will be distributed under the trade name, Tournarope.

High Speed Quarry Drill

THE INGERSOLL-RAND CO., at the Phillipsburg, N. J., plant, was host to a group of technical editors and publishers of business papers related

High speed drill showing feed chain, levelling jacks, steel centralizer and dust collecting hood

to the quarrying and mining industry. The occasion was the introduction of its new and revolutionary type rock drill which they have named the "Quarrymaster." About forty guests were at the display which was held Thursday, February 5, 1948 under the direction of P. J. Bentley, vice-president and general manager of the Phillipsburg plant. Many of those who attended the operating men's sessions at the National Crushed Stone Association meeting in Cincinnati this year will recall the interest that was displayed by the group when Mr. M. L. McCormack of Ingersoll-Rand Co. told of this new drill. This meeting in New Jersey enabled the technical editors to see this drill in operation and to observe for themselves the advantages this machine offers to the industry.

The Ingersoll-Rand Co. had two of these machines on display. One was in Building No. 1 where the group met and where the details of the machine's operation and construction were explained. The second machine was near the plant. It was placed in operation and ran for several hours during the meeting.

The heart of this new rock drill is a powerful, air operated, piston-type drill that strikes upwards of 200 blows per minute. This drill weighs around 4500 lbs. with the entire assembly weighing about 42,000 lbs.

At the first meeting W. A. Morrison explained that the piston type drill is one in which the drill is attached to the piston and reciprocates with it. Drills of this type, he said, are quite old but were crowded out of the quarry industry by the hammer type drills. Thus, with an old type drill all thoughts of pioneering a new product can be eliminated for this type of drill is rugged, reliable, and practically fool proof. The new thing about this type of drill is the fact that it can operate efficiently on a low air consumption. The Quarrymaster is provided with a 500 c.f.m., all-Diesel portable type IR compressor but the actual consumption of air is in the 300 to 350 c.f.m. range at 120 lbs. pressure. The compressor is provided with a regulator so that engine speed changes with drill demands.

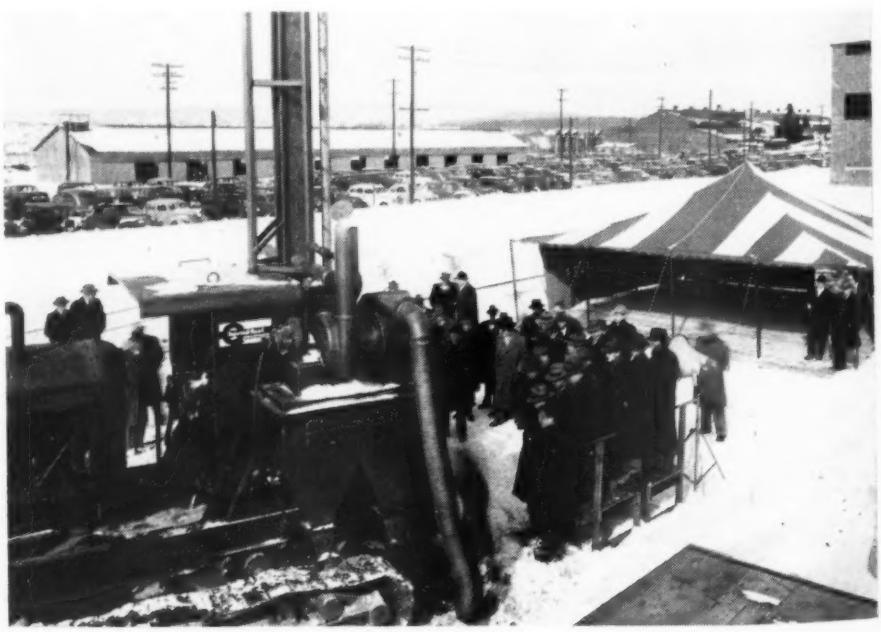
The Quarrymaster is designed to drill holes in the 70-ft. range and up to 6 in. in diameter with the entire assembly mounted on crawler treads that give it a high degree of maneuverability. Extension bars can be used if greater depth is wanted. The air propulsion motors that drive the treads move the equipment at the rate of one mile per hour and have sufficient power to negotiate a 30 per cent grade. Each track of the crawler treads is independently driven by its own reversible air motor.

Four levelling jacks are provided that are hydraulically operated with each jack capable of lifting 15 tons. They permit quick placement of drill, accurate spotting and are also convenient for assisting to remove a stuck drill. The Quarrymaster, it was pointed out, can drill at any angle, therefore precise levelling is not necessary for each drill hole.

The drill was designed with one basic idea being to have a drill that would permit closer spacing of drill holes with better fragmentation and in turn to reduce secondary blasting. Mr. McCormack pointed out that in Cincinnati it was brought out that cuttings in a churn drill hole sometimes take up 70 per cent of the energy used, and that at one quarry a very high number of block holes were required and these added costs would well be eliminated by better fragmentation. This piston drill is so designed that the exhaust air goes down through the hollow drill steel and removes the cuttings. The exhaust air is synchronized with the drop of the bit so that the air blow just precedes the fall of the bit. In addition, means are provided for further blowing the hole quickly and while the drill is stationary. In this case the entire supply in the air receiver pours into the drill hole and removes all cuttings. At the demonstration it was shown that this air also cools the bit for after several hours use in a hard blue limestone, the bit was just warm to the touch.

Cuttings are removed by the waste air and are collected by a dust collecting system that is an integral part of the equipment. It was pointed out that this not only made for better operating conditions but also permitted accurate sampling of the hole by gathering the cuttings to a collector.

The drill used at the meeting for demonstration purposes ran continuously for several hours, starting in a hole that had been previously collared. It drilled at the rate of 13.4 ft. per hr. with an over-all drilling rate of 10.4 ft. per hr. The holes started at about 12 ft. depth and at 35 ft. a second drill stem was added to the drill column and drilling proceeded to near the 70-ft. mark, thus accounting for the different drilling rates. It collared using a 4⅞-in. bit and bottomed at about ⅛-in. less. The drill steel used is 3¾-in. O.D. and has ½-in. walls. It uses a 2- by 3-in. API thread that has been used on cable tools for years. The steel tubing used are in 35-ft. lengths. One of the speakers pointed out that they were experimenting with Carset bits having tungsten carbide inserts.



Guests watching demonstration of the Quarrymaster drill

Dust collector hood around drill stem draws all drill cuttings to a steel hopper

At the discussion the speaker mentioned that in a hard quartzite, conventional drills drilled at the rate of 0.375 ft. per hr. and the Quarrymaster at 4.25 ft. per hr., with this the over-all time in both cases and a 6-in. bit used. In a taconite iron ore they drilled at 8 ft. per hr. with a conventional churn drill doing 1½ ft. per hr. On a coal stripping installation they drilled in softer rocks at the rate of 40 ft. per hr., and at the rate of 8 ft. per hr. in the harder seams. In some cement rocks they penetrated at the rate of 35 ft. per hr. It was here pointed out that gauge wear was a factor of time drill spun in the hole and that a clean hole does not dull a bit as fast and that they got 50 per cent more service out of a bit from this fact. In answer to a question by one of the audience, it was said that the drill cost two to three times that of a well drill rig.

The method of feeding the Quarrymaster drill is the same as they have used on their IR wagon drills and is entirely automatic. One of their larger five cylinder rotary air motors operates the feed. It has a lifting capacity of 16 tons. This same feed motor is used for raising and lowering the steel tower so that the tower can be laid back to move it under any obstructions The cycle for lowering and raising the tower takes about one hour, it was said.

The drill tower or guide is tall enough for the 35 ft. steel and the main column is of 15-in. channels placed back to back and is a strong, one-piece welded structure. It was also pointed out that the Quarrymaster was more than just a new drill for it also was a self-propelled, portable air plant that could easily operate two wagon drills and 5 to 6 jackhammers. The rate of feed can be controlled and the air drill functions properly on a full stroke of the piston or on a short stroke. This control is important where the operator is collaring a hole or working in seamy ground.

The rotation mechanism used in this piston type drill is much the same as in use on piston drills for many years. It is the rifle bar type using a rifle nut and a fluted rifle bar. The pitch of the rifle bar is designed to give the optimum angle of rotation of the bit from blow to blow. The entire assembly of piston drill, rotary air motors, etc., were designed so that any unit could be easily removed and replaced, making any repair shut-downs of short duration.

After the morning demonstration and talks the guests were taken in buses to the Harkers Hollow Golf Club for luncheon. Later they returned to again see the Quarrymaster in operation. The day was concluded with a dinner at the Northampton Country Club near Easton, Penn., where vice-president W. R. Bell gave a brief address of welcome. The editors spoke very highly of Ingersoll-Rand's role as a host.

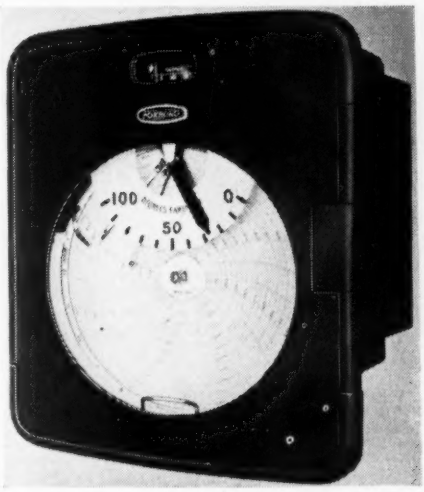
Wire Rope Cutter

MORSE-STARRETT PRODUCTS CO., Oakland, Calif., has patented a portable wire rope cutter which is manufactured in three models, the largest with a capacity for 1½-in. diameter wire rope. The cutting blade and dies are designed to retain the original shape of the wire rope. Wire rope seizing bands, designed for optional use with the wire rope cutter, are also manufactured.

Portable wire rope cutter

Electronic Controller

THE FOXBORO CO., Foxboro, Mass., has brought out what is known as a Dynalog electronic recording pyrometer. As pointed out by the manufacturer, the instrument has no galvanometer, no slide wire, no dry cell, and requires no standardizing. Because of the instrument's continuous balancing action, the recording pen can traverse the full width of the chart in one second's time. Sensitivity is better than 1/30th of 1 per cent of the full scale range, it is claimed.



Electronic recording pyrometer

For applications of temperature measurement, Dynalog instruments are available with ranges between minus 200 deg. F. and plus 2800 deg. F., and for use with thermocouples or electric resistance bulbs. Recorders and recording controllers are offered, and a giant indicating scale, for long-distance reading, is an optional additional feature. In addition to temperature applications, these instruments are in use for the measurement or control of humidity, force, strain pH, speed, and many other variables.

Air-Cooled Engine

WISCONSIN MOTOR CORPORATION, Milwaukee, Wis., has developed a two-cylinder, air-cooled engine which is available in two models, designated Models "TE" and "TF." These engines round out a complete line of 4-cycle air-cooled engines, from 2 to 30 hp., now available in single cylinder, two-cylinder and V-type, four-cylinder types. The Model TE, operating at 1600 to 2600 r.p.m. carries ratings of from 8.3 hp. to 11.2 hp. The Model TF, at the same speeds, provides from 9.9 to 13.3 hp.
ment on pallets.

Hard-Surfacing Electrode

GENERAL ELECTRIC CO., Schenectady, N. Y., has brought out an electrode for hard-surfacing applications where resistance to impact, wear, and abrasion is required. Designated type W-94, the electrode will work harden to over 50 Rockwell C. It operates on a.-c. or d.-c. reverse polarity. It is available in 14-in. lengths, with diameters of ¼-in., 3/16-in., 5/32-in., and ⅛-in.

AUTOMATIC CONTROLS
For Mexico's Newest Portland Cement Plant

Cemento Portland Nacional, S. A., Hermosillo, Sonora, Mexico, recently started operations at new wet process plant having three-section kiln 330 ft. long. Planning to produce commercial stone and agricultural limestone

ONE of the most modern cement plants in Mexico was recently completed and placed in operation by Cemento Portland Nacional, S. A., Hermosillo, Sonora, serving the rapidly growing northwestern area of the country. This plant is second to none in Mexico and compares favorably with some of the most modern in the United States.

This new cement plant will take the place of an older unit which was built and placed in operation in 1930 by Ignacio Soto, president of the company. The first cement plant to be built on the West Coast comprised an 8- x 150-ft. kiln, a 6- x 22-ft. raw mill, and a 6- x 22-ft. finish mill, all Traylor equipment. This equipment was powered by three 17 x 25 air injection Worthington Diesel engines driving Westinghouse 2200-volt three-phase, 60-cycle generators. For years, this plant had sufficient capacity to take care of the requirements in the Northwestern states of Mexico, but industrial growth brought increasing demands for cement until the plant no longer could fulfill all the needs of this area. Another compelling reason for building a new plant was the construction of a large irrigation dam across the Rio Sonora which, when completed, will inundate the old plant site with its impounded waters.

Quarry Operations

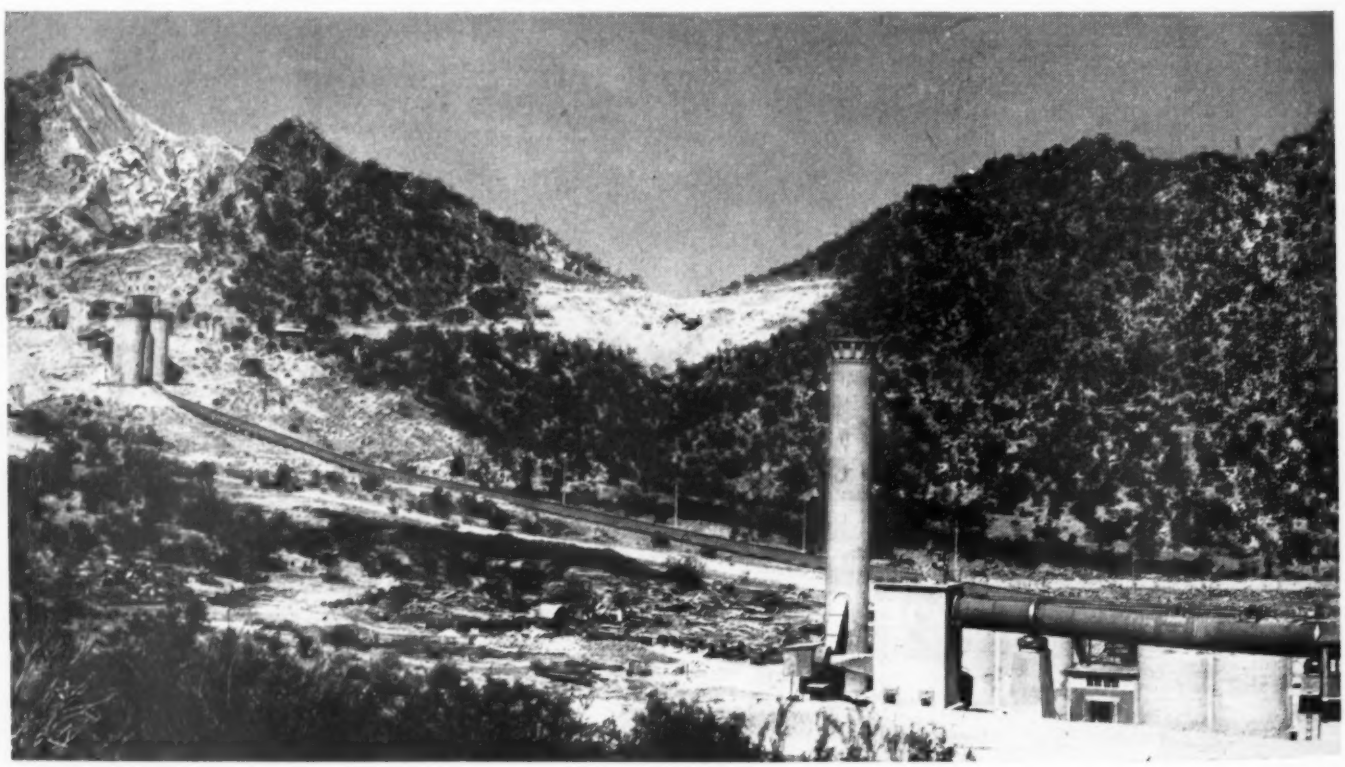
At the new site, the quarry is on a mountain side above the plant. Drilling is done with Gardner-Denver wagon drills supplemented by jackhammers. Blasted rock is loaded into 5-cu. yd. dump trucks by a 1½-cu. yd. P & H. No. 655 B shovel, and hauled to the primary crusher, a 30- x 36-in. type H Traylor jaw crusher which is driven by a 100-hp. Westinghouse motor through a V-belt. Trucks dump to a crusher hopper over a 3- x 8-ft. Sheridan grizzly, driven by a 7½-hp. variable speed motor controlled by the screen operator.

Crushing and Screening

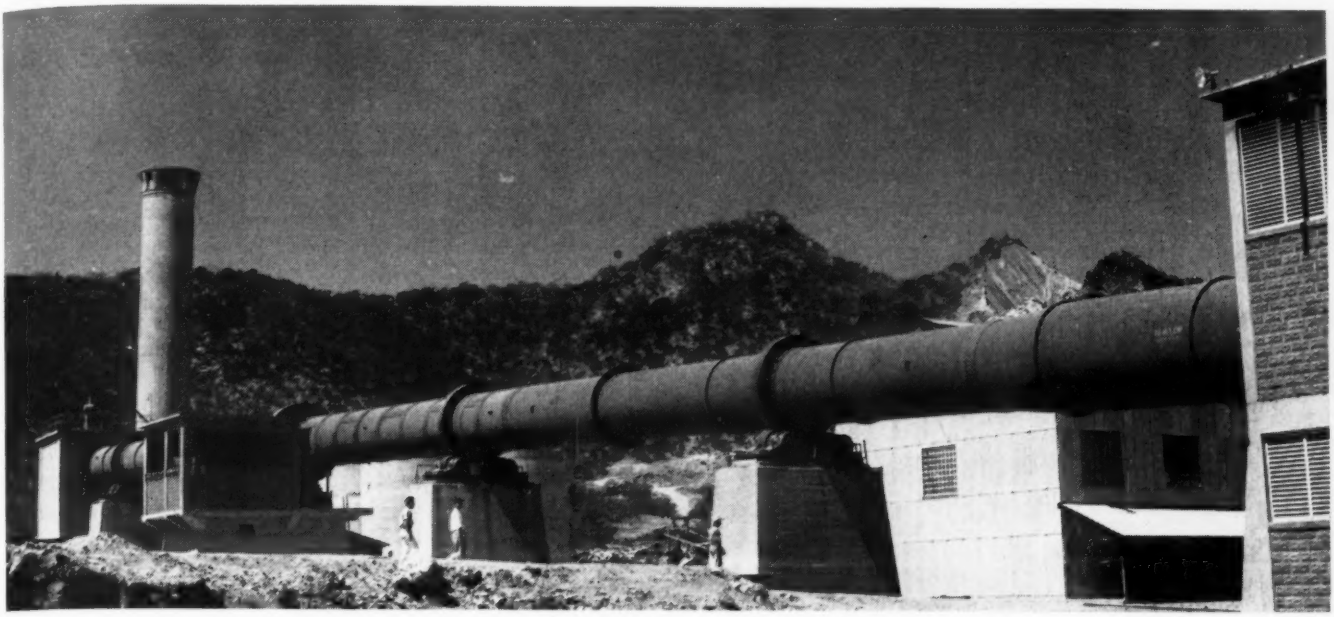
Fines from the grizzly and jaw crusher discharge to an 18-in. belt conveyor which moves material to a 4- x 10-ft., type F300 Tyler vibrating screen. All plus ⅜-in. stone goes to the secondary crusher, a Traylor T.S. 3-ft. model, driven by V-belts from the 100-hp. Westinghouse motor. The product of this crusher, along with the fines from the screen, is carried by a 12-in. bucket elevator to the secondary screen, a 4- x 10-ft., type F 300 Tyler, oversize ⅜-in. material returning to the 3-ft. secondary crusher and fines going direct to the rock storage bins.

Wet Raw Grinding

Raw material storage comprises four 16 ft. diameter concrete silos, 43 ft. high, with a total capacity of 1650 tons. Material discharged from the silos is fed uniformly by Hardinge feeders to an 18-in. belt conveyor, 1600 ft. centers, to the 225-ton capacity concrete bins over two 6- x 22-ft. Traylor, two-compartment wet mills. The chemist takes his sample for raw material tests at the point of dis-



Kiln in foreground with quarry up in the mountains, to the left, and below may be seen crusher station and raw storage silos with long conveyor to cement mill, to the right



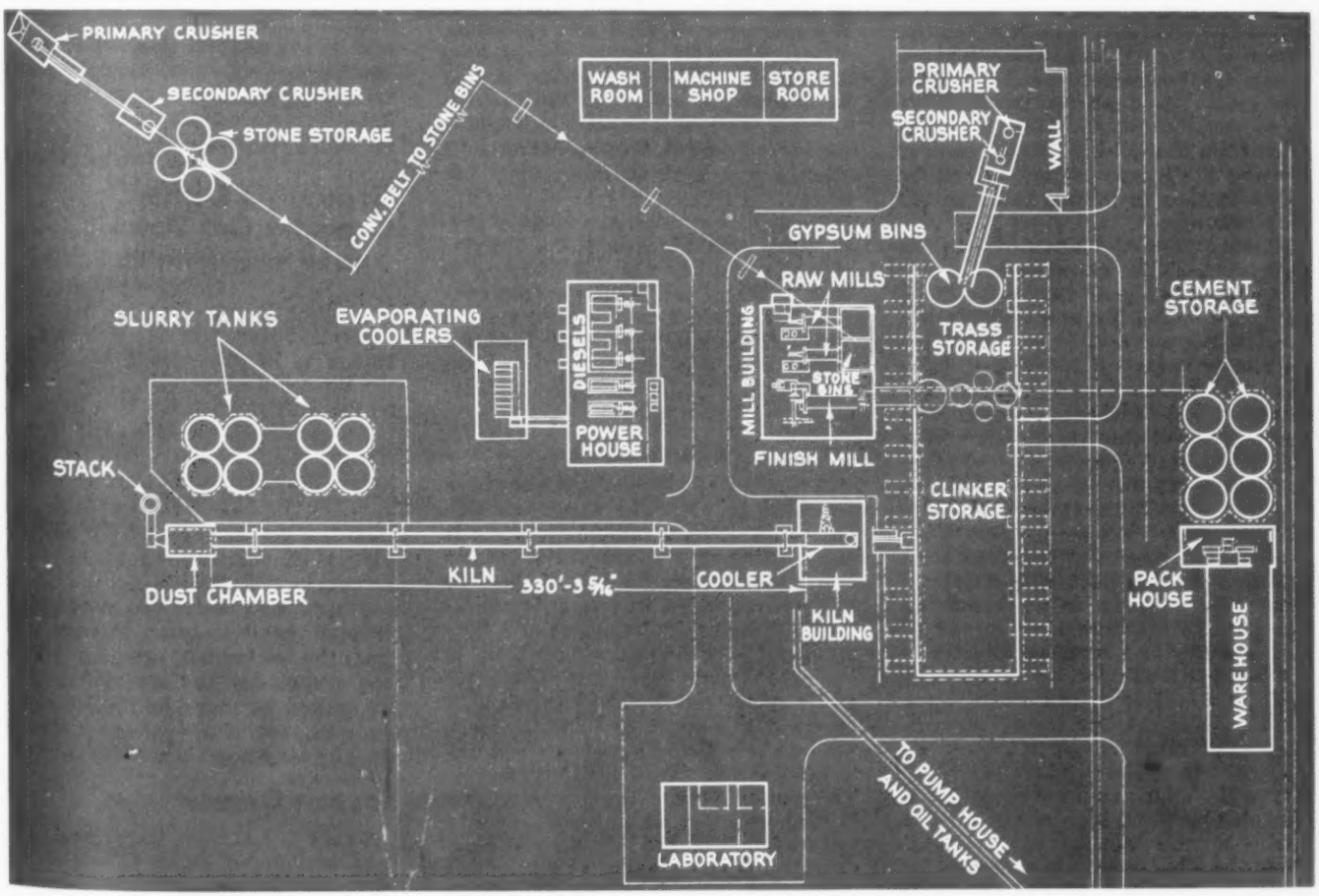
Long kiln for wet process plant. Note unusual stack and observation platform

charge to the Hardinge feeders. The two raw mills, formerly in the old plant, are driven by 300-hp. Westinghouse motors, direct-connected by Pacific gear reducers to the mill pinion shaft.

From the mills, slurry is fed to duplicate 4-in. Wilfley pumps which discharge to the slurry storage. This storage comprises six storage and two mix or kiln tanks. All tanks are 20 ft. in diameter by 30 ft. deep, of concrete construction with a cone bottom. Air agitation equipment was supplied by Fuller Co. The 4-in. Wilfley pumps deliver the slurry from the kiln tanks to the ferris wheel feeder, a constant overflow being maintained to assure a steady feed. The ferris wheel is driven by a synchro-tie with the kiln.

Kiln Operation

To provide a kiln 330 ft. long for the new plant, 140 ft. of the old kiln was used with a new 190-ft. section. Of this total length, 279 ft. is 8 ft. diameter, 10 ft. represents a tapered section, and a 41-ft. section is 9 ft. 6 in. diameter. The first 70 ft. from the feed end is not lined but is



New wet process cement plant layout showing raw material crushing, conveying and storage arrangement

Overhead traveling crane reclaims raw materials from open storage bins

equipped with chains, the remainder being lined with 6-in. brick. The kiln is driven by a 100-hp. variable speed motor through a V-belt and No. 12½ Falk gear reducer to the kiln drive pinion.

Gases from the kiln pass through a large dust chamber with the draft being controlled by louver dampers on the suction side of a No. 1050 type E American Blower fan driven by V-belts from a 75-hp. Westinghouse squirrel cage motor. This fan draws the gases into the 9- x 100-ft. brick lined concrete stack. Kilns are fired with Coen fuel oil burners. Steam for heating the burner oil is supplied by a No. 50 Cleaver-Brooks boiler at 100 lb. pressure.

Clinker from the kiln drops to the 5- x 25-ft. Fuller air quenched cooler from which it goes to the boots of duplicate bucket elevators and thence into clinker storage. It is planned to eventually install a Merrick weightometer between the cooler and the elevator, and provision also has been made for the future installation of a 22-in. standard Symons cone crusher to reduce clinker to ¾-in. A 5-ton Whiting traveling crane over a 60- x 220-ft. open storage area moves clinker, trass and gypsum direct from storage to mill bins. Material reclaimed from mill bins is weighed out by Schaffer Poidometers over an 18-in. belt conveyor and is moved directly to the 7- x 30-ft. Traylor, 3-compartment mill. The mill is driven direct by a 600-hp. Westinghouse motor through a gear reducer.

Cement from the mill is conveyed by a type H Fuller pump to the six 22-ft. diameter by 65-ft. high concrete silos, having a total capacity of 6000 tons. From the silos, cement is reclaimed by a type C portable Fuller pump which delivers the cement to the packing machine bin. Packing is done with one 4-tube Modern valve machine. Paper bags, holding the standard 50 kilos, are used. From the packing machine, one end of a 30-in. belt conveyor delivers bags to freight cars and the other end, reversing the movement, takes bags to the truck loading door. Provision also has been made for bulk loading either to cars or trucks. Cars are spotted by a Link-Belt car puller winch. The area around the packing machine and belt is kept free of dust by a Sly dust collector. Next to the packing room is a storage warehouse for sacked cement. Two rooms for sack storage are kept at the proper humidity.

Trass and gypsum are given a preliminary crushing in a 12-in. Traylor gyratory crusher which discharges to a short 18-in. belt conveyor that conveys the product to a 4½-in. type T Traylor. The latter crusher is in closed circuit with a 3- x 8-ft. Tyler screen to provide a ⅜-in. product for delivery to the finish mill.

Kiln Controls

A number of kiln controls have been provided to maintain maximum efficiency: a Brown radiamatic records the burning zone temperature, hot air being taken from the top of the kiln and maintained at its proper temperature automatically by means of a butterfly valve in the cold air duct. Oil is kept at the right temperature by automatic steam valves. The kiln speed is recorded on a chart, and totalizers are used on both the kiln and ferris wheel to provide a record of shift operations. The temperature of the discharge gas is also recorded on a circular chart meter. Draft at the kiln hood is indicated on a draft gage, and is maintained constant by the automatic adjustment of the louver dampers on the suction side of the draft fan. Draft at the discharge end of the kiln is indicated by a gage on the firing floor control panel.

Both kiln fuel and Diesel fuel is received by rail and pumped from the cars by Worthington pumps to the 2,500,000 liter fuel storage tank and the 900,000 liter Diesel oil storage tank.

The three original 17- x 25 air-injection Worthington Diesels and two new SDH-8 turbo-charged Worthington Diesels supply power. Generators are 2200-volt, 3-phase, 60-cycle Westinghouse units with a total generator capacity of 2850 kv.a., which is ample for emergency shut-downs and for expansion.

In laying out the crushing and screening plant, provision has been made for the production of commercial crushed stone and agricultural limestone should future demands require this expansion. The steadily increasing agriculture development of this area indicates a big future demand for agricultural limestone.

The new plant was designed and the construction supervised by the Macdonald Engineering Co., Chicago, Ill. Lew Whitney of the Macdonald company was directly in charge of the construction.

Officers of Cemento Portland Nacional, S. A., are: Ignacio Soto, president; Corl. Octavio A. Serrano, vice-president; Luis C. Soto, vice-president; Francisco Martinez Ruiz, secretary; and Enrique Soto, general manager. Operating personnel include: Edwill B. Smith, plant manager; Miguel A. Soto, superintendent; and Jesús Ramírez V., chemist.

Germany's Cement Capacity Cut Down

REPRESENTATIVES of the German cement industry expressed concern when it became known that of a total of 60 cement works in the British Zone, 29 are to be dismantled, after which the zone will be permitted to produce no more than 4 million tons annually.

As reported by *Mineral Trade Notes*, U. S. Department of Commerce, May, 1947, the German cement industry in the British Zone has lodged a protest against the dismantling plan, pointing out that such an output is not enough to satisfy requirements in the zone alone which suffered heaviest war damage, and that the estimated capacity of the works, even during the period of highest output, as given by the Nazi government, was 24 per cent over the actual production rate.

Reopen Quarry

NALLY & BALLARD, Bardstown, Ky., have announced plans to reopen the limestone quarry at Ullin, Ill. The quarry has been idle for forty years.

LABOR RELATION TRENDS

The Right to Have a Job

By NATHAN C. ROCKWOOD

THE TAFT-HARTLEY ACT prohibits the narrowly defined "closed shop," but under specified conditions permits a "union shop." A union shop contract allows the employer to accept non-union employes, but they can not continue to hold their jobs unless they join the union within a specified period—usually 30 days; otherwise the employer must fire them. Some 15 of our 48 states, however, have adopted similar legislation or amendments to their state constitutions, some of which make no distinction between "closed" and "union" shop contracts.

The trend seems to be in that direction, as the abuses of union labor leaders become better known. A typical example is the exposé of rackets in the building construction industry, which largely account for the high cost of housing, being brought to light by a Congressional investigating committee. In that connection a recent decision of the Supreme Court of North Carolina is particularly interesting and significant because it concerns a situation in the building construction trades that is common in nearly all cities.

The North Carolina law antedates the passage of the Taft-Hartley Act, and is entitled the Right to Work Statute (Chapter 328 of the Sessions Laws of 1947). It is described as "An act to protect the right to work and to declare the public policy of the state with respect to membership or non-membership in labor organizations as affecting the right to work: To make unlawful and to prohibit contracts or combinations which require membership in labor unions, organizations or associations as a condition of employment: To provide that membership in or payment of money to any labor organization or association shall not be necessary for employment or for continuation of employment and to authorize suits for damages."

The Act is in 10 sections, which provide (1) that the right to live includes the right to work and that it is the declared public policy of the state to protect this right; (2) that any agreement or combination between employer and labor union in which a person is denied work or a continuation of work because of failure to join a union is declared to be against the public policy and an illegal combination or conspiracy in restraint of trade or commerce. Sections (3) and (4) are complementary; (3) provides that no person shall be required to join or remain a member of a union as a condition of employment; and (4) that no person shall be required to abstain or refrain from membership as a condition of employment (the so-called "yellow dog" kind of contract). Section (5) states that no employer shall require any person, as a condition of employment, to pay union dues, etc.; (6) any person denied employment because of the foregoing reasons is entitled to recover, in the courts of the state, appropriate damages against the employer and/or any other persons or organizations responsible. Section (7) provides that the Act shall not apply to existing contracts but will apply to all new ones and to any renewal or extension of existing contracts. The sections (8), (9) and (10) are the usual ones stating that if any part of the Act is adjudged invalid, the rest of the law is to remain; and repealing any previous laws that may be in conflict with this Act.

Violation a Misdemeanor

Under Chapter 75 of the General Statutes of North Carolina, combinations, conspiracies and contracts in restraint of trade are illegal and punishable as misdemeanors. In this case a building contractor in the city of Asheville entered into such a contract with the head of the Building and Construction Trades Council of the city, acting for and with the officers of the five building trades unions (electrical, carpenters, painters, masons and plumbers), all affiliated with the American Federation of Labor. The contract was of the usual closed-shop variety, providing that the employer-contractor agreed "to abide by all rules and regulations of the respective trades affiliated with the Building and Construction Trades Council," and that he would employ none but union members. All this was done openly in plain violation of the new law.

The contractor and the six labor union officers were accordingly charged with violation of the law and were tried by a jury in a local police court; were found guilty and were fined $50 and assessed one-seventh of the costs each. The seven defendants moved for an arrest of judgment and the motion was over-ruled. They appealed to the Superior Court and lost, and then carried the case to the State Supreme Court, which recently rendered the final decision, unless the defendants can find cause to appeal to the U. S. Supreme Court. That the case is considered a critical one to the American Federation of Labor is evidenced by appearance in its behalf of its top-notch legal talent, Padway, Woll, Thatcher, Kaiser, Glenn and Wilson.

The defendant employer testified and gave his reasons for his willingness to enter into the closed-shop contract with the unions. These are reasons with which everyone who knows the construction industry is familiar. Of course, he couldn't have done business otherwise. The defendants as a whole based their defense on the grounds that the law violated Article I, Section 17, of the Constitution of the State of North Carolina and the 14th Amendment of the Constitution of the United States, which have reference to the due process and equal protection clauses. They further claimed violation of the 1st Amendment of the Constitution of the United States which guarantees freedom of speech and assembly, and the 14th Amendment in that it is designed to prevent invasion of constitutional rights by a state. Thus the issues are fundamental.

Within State Police Power

JUSTICE SEAWELL of the State Supreme Court delivered a ruling so well reasoned and potent that it may well become a classic, and it certainly will have a far-reaching effect. Space here will permit our touching only a few high points; in doing so we will follow the court's phraseology so far as possible, but only those paragraphs in quotation marks are the exact words. The whole decision makes interesting and instructive reading. Since the defendants admitted their violation of the law, it is only the constitutional questions that are involved.

The court held: "While the basic laws under which the validity of the challenged legislation must be determined are elementary, they are, nevertheless, so fundamental as to bear summarization at this point. The 10th Amendment to the Constitution of the United States provides: 'The powers not delegated to the United States by the Constitution nor prohibited by it to the states, are reserved for the states respectively or to the people.' Within this reservation of powers to the individual states, is what has been judicially termed 'the police power.'"

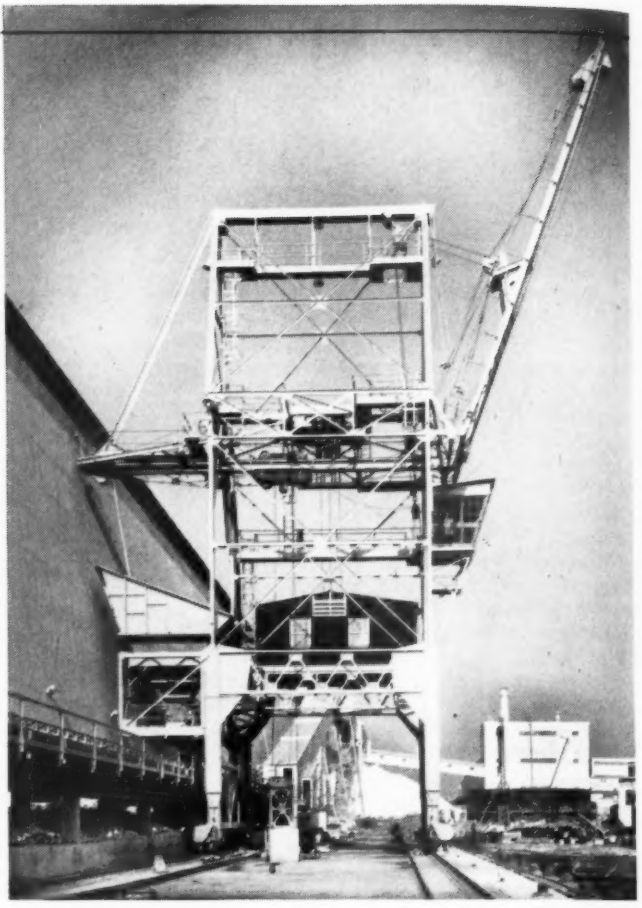
The judge accordingly decided that the law in question is a constitutional exercise of the police power of the State of North Carolina as a measure deemed necessary in the interest of public welfare. "Neither the 14th Amendment of the Federal Constitution nor Article I of the State Constitution contains any unqualified prohibition. Both operate to prevent the legislature from depriving anyone of individual or property rights except by due process of the law. Due process, is, of necessity, an elastic term, which through the years has been expanded to cope with varying problems of our increasingly complex society. * * * The elasticity of these restrictions [decisions quoted] upon the use of the police power is the life-giving elasticity of the Constitution itself, so vital to our economic, social and political growth. Perhaps more than any other social force, the progress of labor toward its rightful place in our society would have been retarded if all statutes enacted in the exercise of police power had been measured on the

(Continued on page 129)

Wallboard Production Speeded Up With LONG BELT

National Gypsum Co.'s new Baltimore, Md., unit is one of the most modern wallboard and gypsum products plants in the world. Dock and storage facilities permit rapid handling of raw gypsum transported by boat from Nova Scotia

By W. B. LENHART

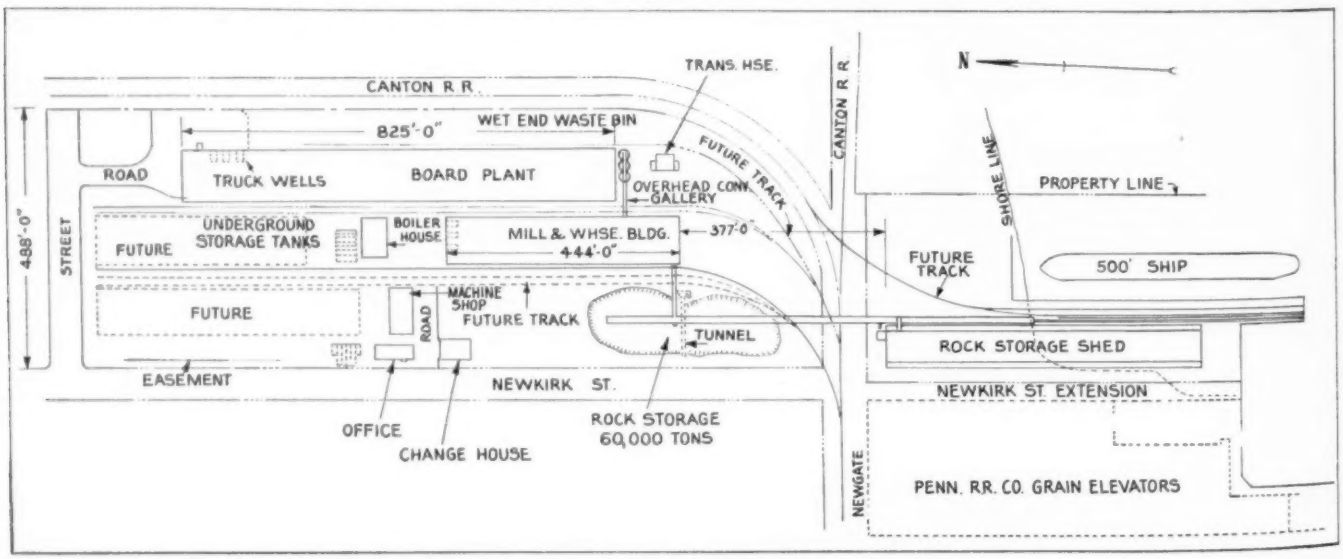


Traveling crane unloads ocean-going vessels. It moves over rails to reach any hold in a boat, and it unloads to the hopper, to the left, that serves the first belt conveyor in the system

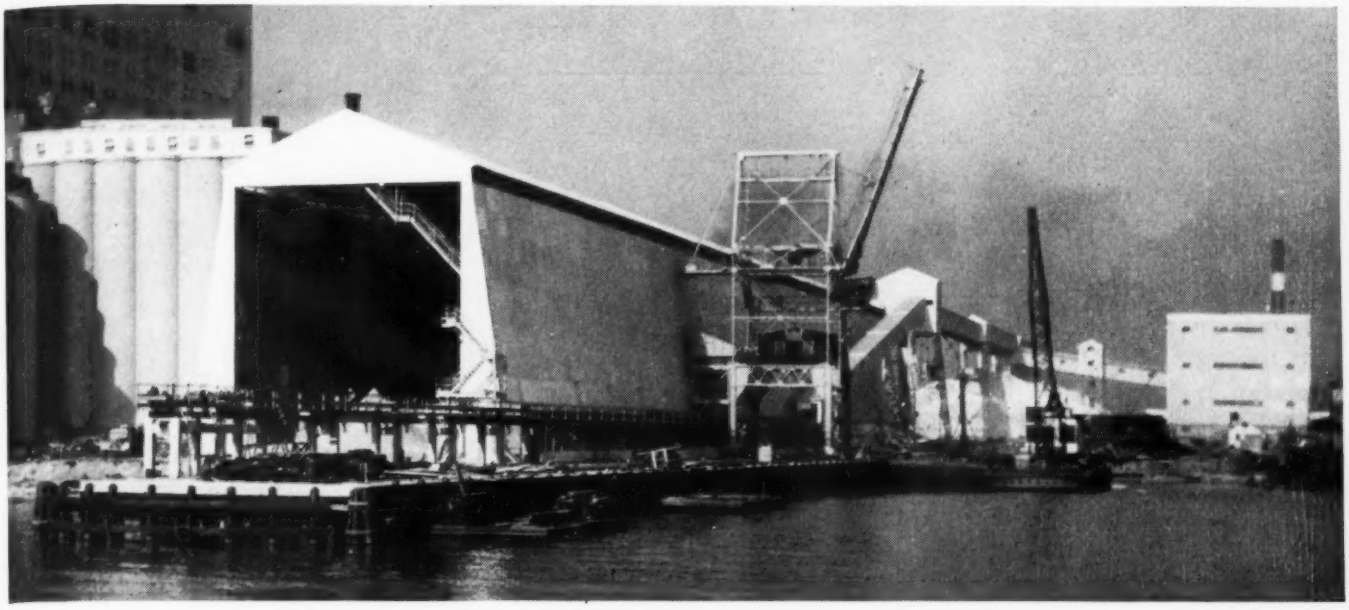
ONE of the most modern gypsum calcining and wall board plants in existence was recently placed in operation by the National Gypsum Co. in Baltimore, Md. Another large capacity and ultra modern processing plant has been added to the company's expanding manufacturing facilities under the guiding hand of the president, Melvin H. Baker. In the December, 1947, issue of ROCK PRODUCTS the new lime plant at Kimballton, Va., was described.

Located in the Canton district of industrial Baltimore, the new gypsum plant covers approximately 16 acres and represents a multi-million dollar investment. Company engineers prepared most of the design, but the erection contract was awarded to Baltimore Contractors, Inc. Work was started on the project in August of 1946. It is one of the largest contracts for industrial construction ever let in the Baltimore area.

Buildings arranged for efficient production of the gypsum products have steel superstructures with reinforced concrete for the floors and foundations. The lower sections of the building walls are of brick with metal sheathing. The mill building is 444 ft. long and 88 ft. wide, and is four stories high. The wallboard building is 775 ft. long and 100 ft. wide, and is three stories high at its highest point. Building interiors are lined with insulation board made by the National



Layout of gypsum wallboard plant, dock and rock storage

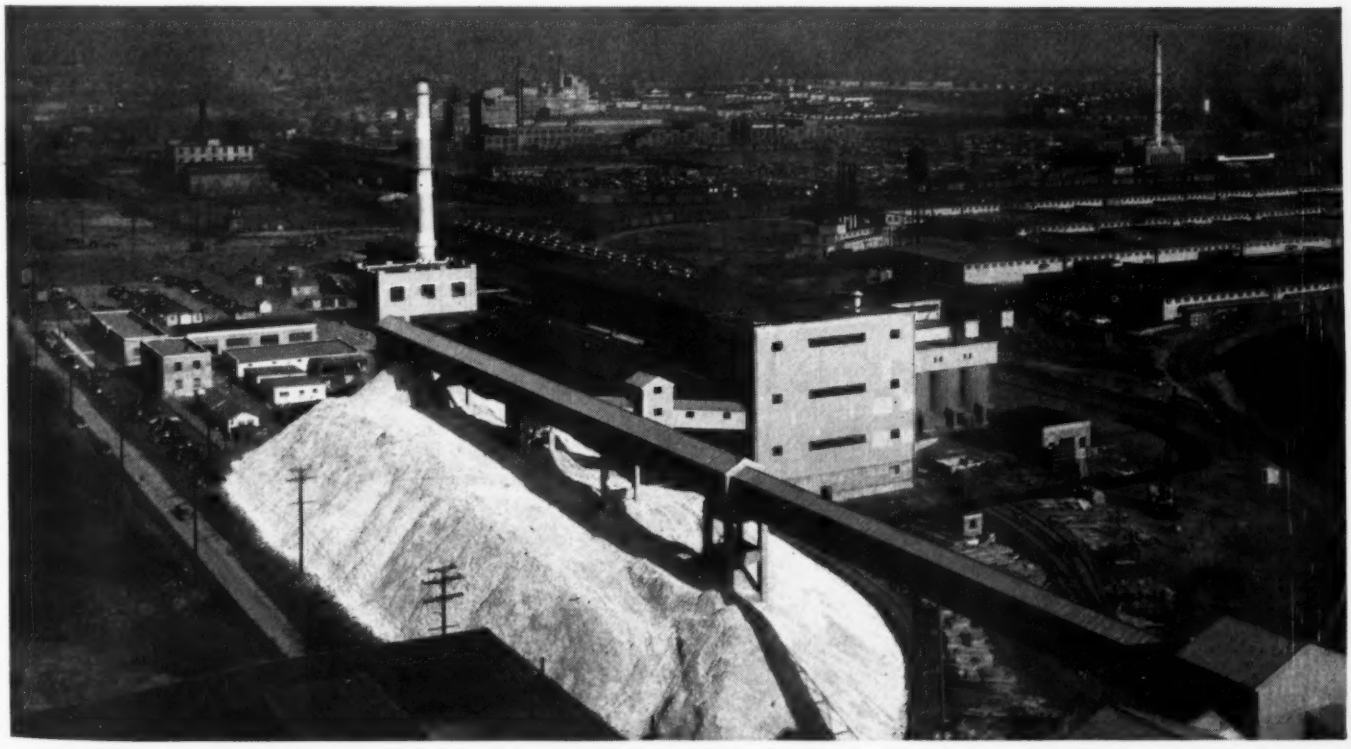


Unloading crane, to the right, alongside storage building, with the mill in the background, to the right, as viewed from a point in the harbor

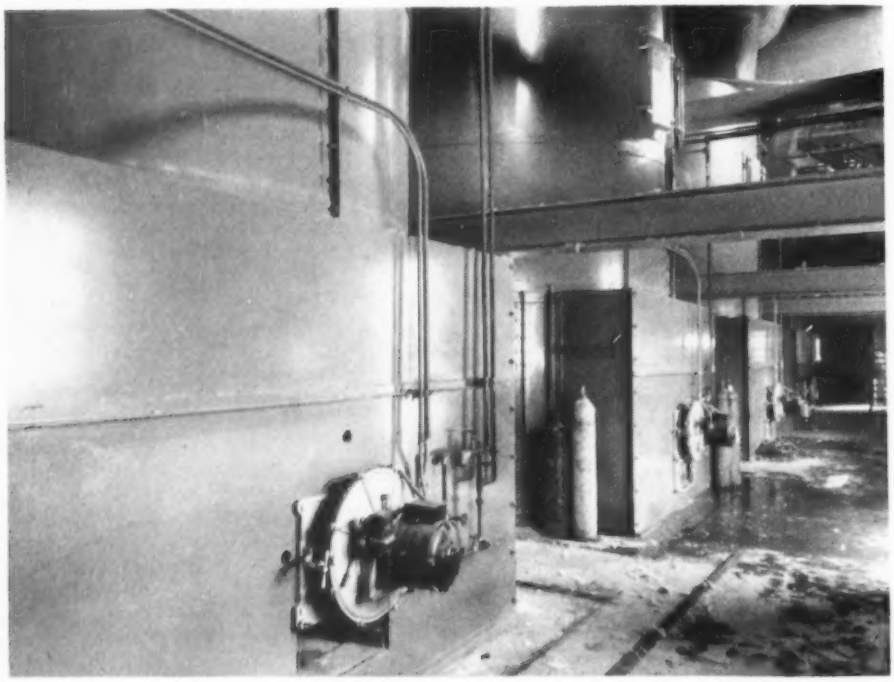
Gypsum Co. Ceilings are painted white and also the walls down to the 5-ft. horizon where the paint is gray to the floor line. A 2-in. marker line divides the two painted sections. Other structures include a two-story employe's service building; a one-story office, maintenance, and warehouse building; transformer building; and sewerage disposal building, etc. Employe toilets and wash rooms are placed at convenient points about the huge plant. One of the dominant features of the landscape is the 185-ft. stack serving the steam plant. A fully-equipped machine shop and other plant repair facilities are provided. Sections of the buildings where cars or trucks are loaded are available with covered loading facilities.

Ample bin capacity ahead of each important unit in the plant has been provided. The bins, all of steel construction supported on heavy steel structural members, are parabolic in cross section. The various bins in the order of their use can be best seen in the accompanying flow sheet.

Three company-owned ocean-going boats ply between the National Gypsum Co.'s seaboard plants and Nova Scotia; the "Dingwall," "Cheticamp," and the "Walton," named after the three gypsum quarries owned and operated by the company in Nova Scotia. Each boat hauls 10,000 tons of crude rock. Deliveries are made from June 1st to about the middle of November when water traffic stops due to weather conditions in the northern climate. To tide over the operations during the Winter months, each of the seaboard plants has suitable stockpiles. These gypsum plants, all of large capacity, are located at the Bronx, New York



Outside storage dominates this view with the mill and wallboard buildings, to the right. Stack rises from steam boiler plant that heats the various buildings and also provides steam for drying the wallboard



All the kettles are oil-fired, and each kettle is enclosed in a steel jacket

City; Savannah, Ga.; Portsmouth, N. H., and the newest at Baltimore, Md. The boats handle roughly a million tons of gypsum rock per year, all of which is secured from open pit operations in Canada.

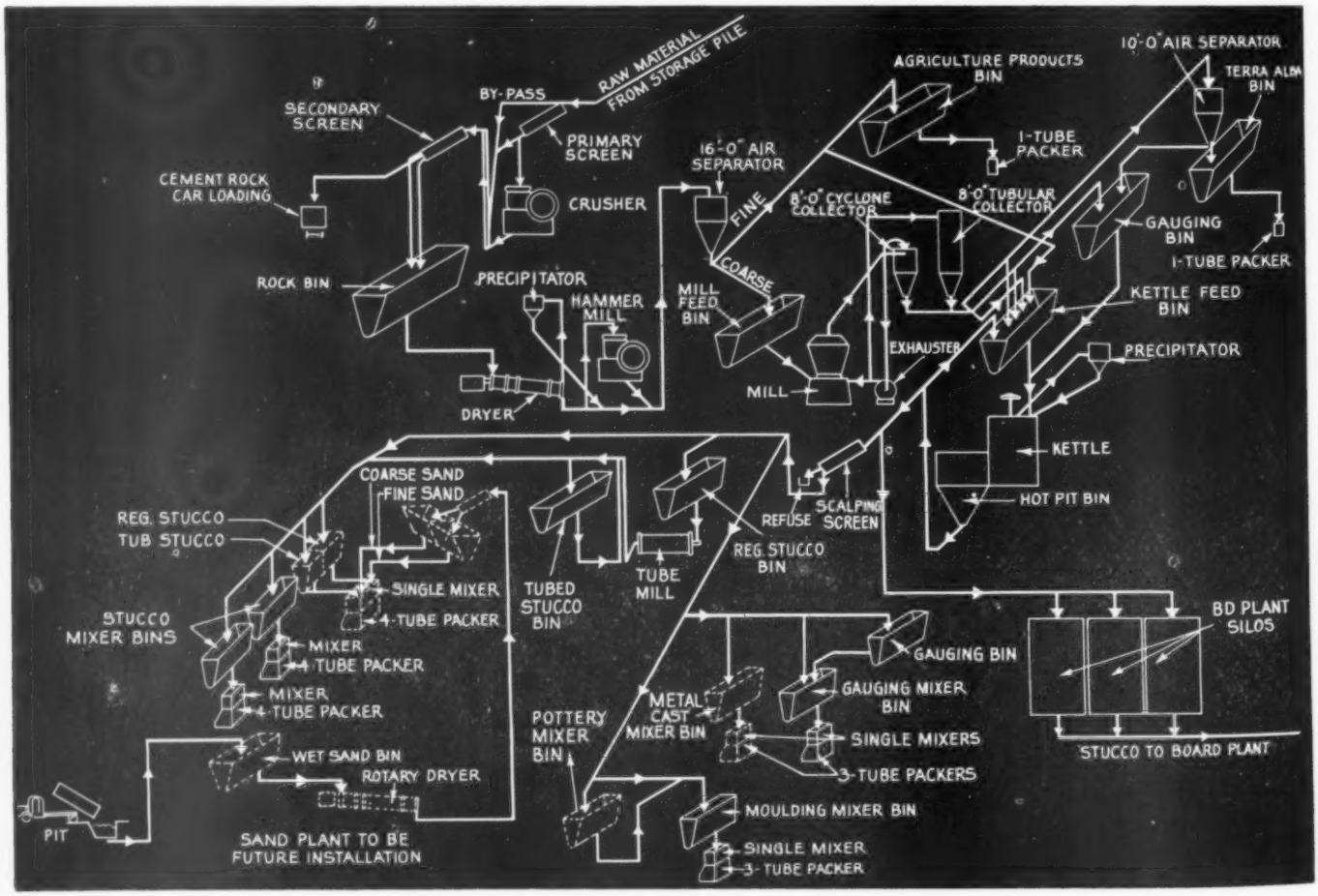
A feature of this new plant is the dock facilities. The pier is of cellular construction and one of the most modern in the state. About 3000 tons of sheet piling were used in its construction. The deck of the pier is of reinforced concrete, and is of massive construction, for it supports about 60,000 tons of "under-cover" crude rock storage as well as the unloading and reclaiming equipment.

Modern Dock Facilities

As shipments by water from Nova Scotia are for only about six months of the year, the company provides storage at Baltimore for 140,000 tons of crude rock. Of this total, 60,000 is on the dock proper stored under cover, and the remainder of 80,000 tons is stockpiled outside at the south end of the dock so that the two storage piles are in a single line. All rock is delivered to the plant crushed to about 5 in., and is wet as the crude gypsum is washed at the loading points and all impurities removed to enable the National Gypsum Co. to maintain the highest standards of quality.

On drawing alongside the pier the boats are unloaded with a crane augmented by air tuggers. Stevedores do the final clean-up in the hold of the ship. Only a short period is required to unload and clean up the hold of each boat. However, the McKarin-Torrie crane used for unloading can do its part at the rate of 500 tons per hour. This crane delivers to a movable Robins unloading tower that serves the dock-side conveyor.

Unloading and reclaiming systems



Flowsheet of gypsum preparation plant for wallboard and other products

for the two piles involve five Link-Belt conveyors. Loading belts are 30-in. wide and the reclaiming belts are 24-in. All belting is U. S. Rubber Co., with ⅛-in. Buna S rubber on the top side and 1/16-in. on the under side. Conveyor belt equipment is carried on heavy steel supports and involves several thousand feet of belting.

Conveyor System

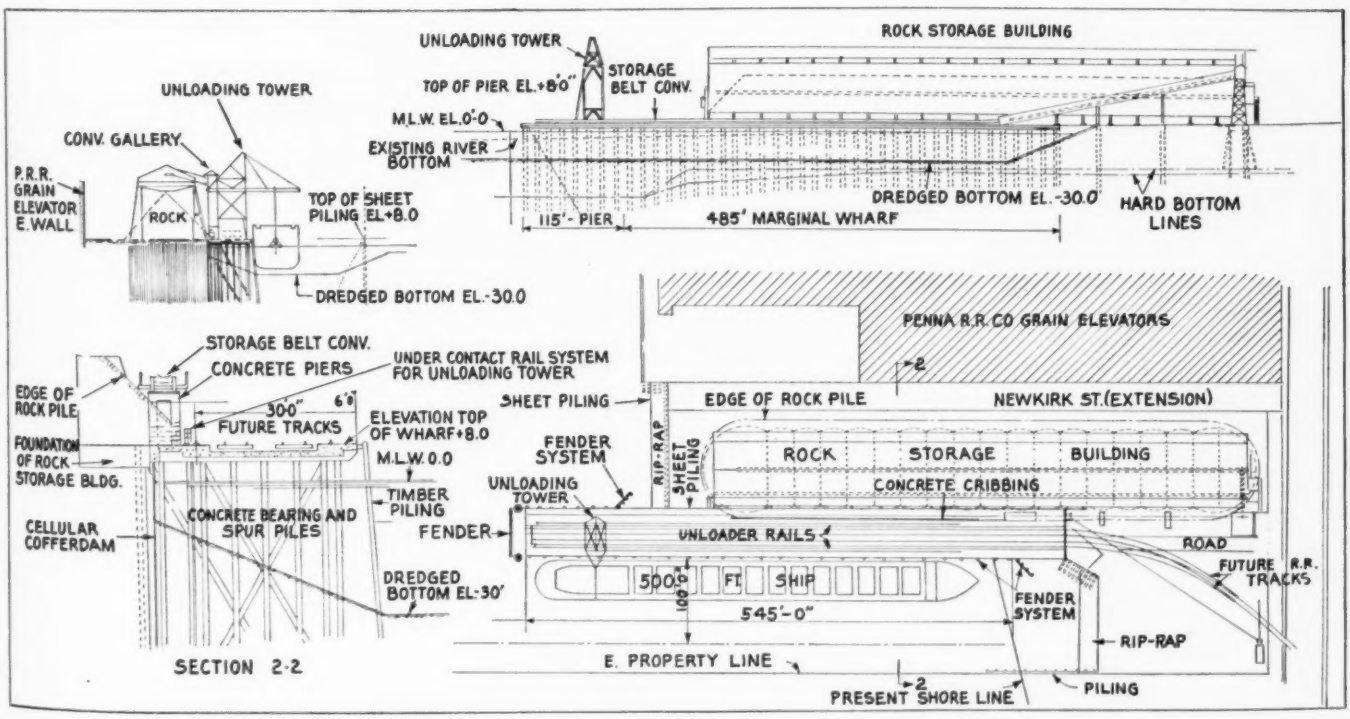
The five belt conveyors can be listed as follows: (A) The first belt or dock conveyor receives the rock from the ship side. This conveyor which starts near the sea end of the dock and inclines upwards, has a length of about 775 ft., centers and moves at 400 f.p.m. (B) A short cross stub conveyor moves the crude rock to the inside. (C) A 30-in. return belt conveyor that carries the rock towards the sea end of dock and distributes it over the 60,000 ton inside storage stockpile by a Link-Belt power-driven tripper. (D) A 30-in. belt, 665 ft. centers, takes the crude rock from the stub (conveyor A) and delivers it to the outside storage. (E) A 595 ft. reclaiming belt that can reclaim the inside under-cover rock for delivery to the plant. It is 24-in. wide, moves at 250 f.p.m. and will handle 200 t.p.h. A P & H crane, 3-ton capacity, operates in connection with this conveyor placing the rock on a Link-Belt apron feeder which in turn serves the outbound conveyor. (F) At about the middle of the outside storage is a sixth conveyor that angles off to the main plant. It is about 140 ft. long. By means of this conveyor and a bucket elevator augmented by either a Link-Belt dragline or a Sauerman dragscraper, outside rock is delivered to the plant proper.

In the left background is the unloading crane. The No. 2 conveyor inclines up to the top of the inside storage building

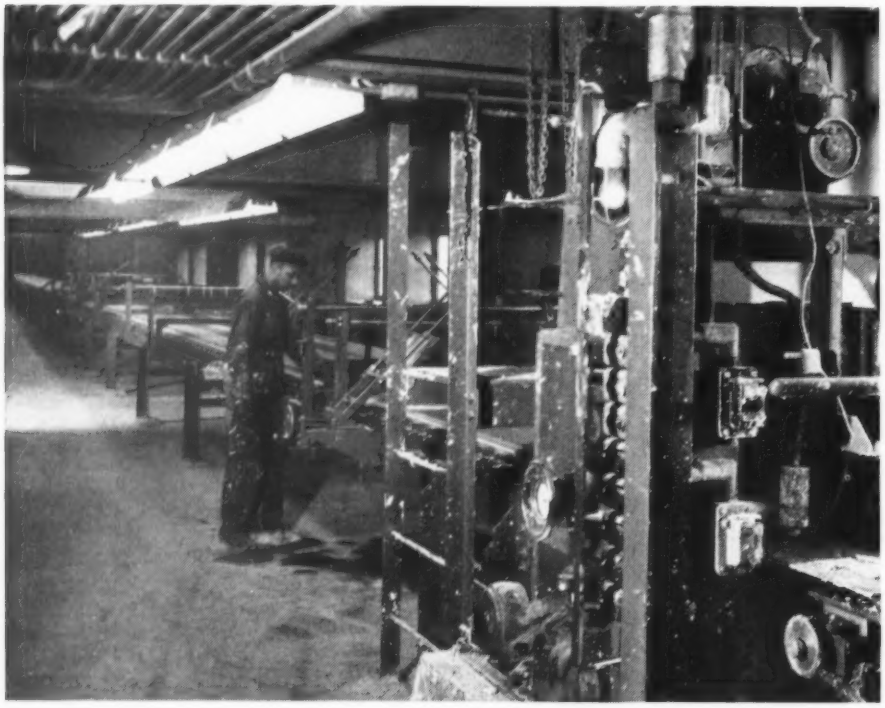
Calcining and Grinding

There are four 16-ton capacity, oil-fired Ehrsam kettles provided with independent drives. Calcining is carried out on 2-hour cycles. Provision has been made for installing two additional kettles at some future date. The kettles have the usual rabble arms and pressed steel bottoms. On 2-hour cycles these four kettles can turn out 750 tons of stucco per 24-hour day.

For regrinding plasters for the sacked trade, a 7- x 22-ft. F. L. Smidth tube mill is used with provision for a second similar mill at some future time. The ground gypsum going to the kettles is about 85 per cent minus 100-mesh. There are five Raymond mills for the preliminary grind ahead of the kettles, with each mill having an 8-ft. cyclonic dust collector with the collector vents connected to a Raymond tubular type bag collector.



Elevation and plan details of dock facilities and rock storage



Forming end of the wallboard machine

Under the main tube-milled stucco bins are four Ehrsam mixers that serve two 4-tube Bates packers. Under the gauging plaster bin is a single Ehrsam mixer and a 3-tube Bates packer. Under the moulding plaster bin is a mixer and a 3-tube sacker. At the raw end, ahead of the kettles, is an agricultural gypsum bin serving a 2-tube packer.

After passing through the Tyler type 38 Hum-mer scalping screens, the stucco from the hot pit moves by screw conveyors to the sacking plant. A by-pass screw moves the stucco to three silos serving the board plant. From the silos the stucco is delivered by screw conveyors and a bucket elevator to a constant head bin ahead of the wet mixer at the head of the wallboard machine.

Transfer end of the wallboard machine. Boards coming off the belt at the far left are transferred onto the conveyor and moved to the foreground. The inclined section is the "elevator" which feeds the drier and is controlled by an "electric eye"

Wallboard Plant

On the second floor of this building is the wallboard machine and Coe dryer. The lower floor is devoted entirely to storage. The wallboard machine has a belt that takes about two thirds of the length of the building which is 775 ft. long. The belt speed is regulated to produce in excess of 100 lineal feet of wallboard per minute, and the conventional 4-ft. wallboard or three strips of the narrower gypsum lath can be made. Built to designs of the company, the wallboard machine has an Ehrsam cut-off knife and Ehrsam punch.

Flat rolls carrying the long belt of the wallboard machine as well as the return rolls are provided with roller bearings. Roller bearings were supplied by Link-Belt.

At the cutting end of the wallboard machine is a 24-ft. transfer table provided with live rolls which function to lead the green board into the eight-deck Coe dryer. When the equivalent of four wallboard sections are on the elevator, an electric eye closes the circuit of the motor operating the elevator which rises at the out-board end and delivers the green board into the dryer. When four more boards are on the elevator, it automatically (through the electric eye) changes its position and places the boards onto another deck of the Coe dryer. At the other end of the dryer is an automatic take-off that delivers the boards to one level where they are bundled in company-designed bundlers. A separate bundling machine is used for the lath.

Two Yale and Towne Hi-lift trucks and two Elwell-Parker Towmotors are used to handle the finished material in and about the wallboard storage room (capacity of 9,000,000 ft. of board) and from the bundlers. The Hi-lifts have a capacity of 5 tons each. The bundles of board are handled on wooden pallets.

Rolls of paper for the top sheet of the wallboard are elevated to the proper floor by a 5-ton Shepard-Niles lift crane. Two turntables are arranged so that no manual lifts are required to put the paper into position on the wallboard machine. At the rack for the paper rolls is a second 3-ton Shepard-Niles hoist. Paper for the wallboard plant comes from the company's own paper mills located at Kalamazoo, Mich., Newburgh, N. Y., and Garwood, N. J.

All the company lift trucks are provided with special guards for the operator to prevent injury should he back the unit into a wall or other obstruction. The company has its own specially designed beaters for making board pulp.

Flow of Material Through Plant

Rock (minus 5-in.) from the main storage facilities is delivered into the plant at considerable elevation by conveyors and falls over a F-600 Tyrock primary vibrating screen with ¾-in. mesh. Oversize passes to a Pennsylvania ring crusher set to deliver a 1½-in. product. Fines from the screen and the throughs from the crusher join and go to a bucket elevator feeding a second Tyrock vibrating screen. This is provided with a screen cloth to give a fine and a coarse portion both of which can go to a steel rock bin, or the coarse portion can be by-passed and loaded to cars for cement rock if desired. An alternate flow permits the 5-in. rock to by-pass the first screen and the crusher and go to the bucket elevator ahead of the second screen.

Under the rock bin are two short shuttle conveyors that deliver to a Hardinge rotary dryer that is provided with a Koppers electric dust precipitator. The dry rock goes to a bucket elevator that discharges to a Pennsylvania reversible hammer mill. The discharge from the hammer mill is chuted to another bucket elevator and thence to the Raymond air separator. Or, the dryer can discharge direct to the bucket elevator and by-pass the hammer mill. The fine dust from the dryer dust collector goes to the elevator serving the separator.

Three products are obtained from separators: a pea sized rock that goes to the steel bins over the Raymond mills, the fines for the kettles, or agricultural gypsum which can go to its proper bin ahead of the sacker.

The pea sized gypsum falls to a sectional parabolic steel bin holding 550 tons of gypsum rock. This bin supplies the feed to the five Raymond mills. Ground products from the battery of cyclone and Raymond tubular dust collectors serving the Raymond mills pass to the kettle feed bins. From the kettle feed bins the ground rock is chuted to the kettles and is calcined. The kettles are provided with Koppers precipitators, the collected dust returning to the kettles. Calcined gypsum falls to the hot pits which are provided with drag chains. From the hot pits, the stucco is elevated in bucket elevators, there being one elevator for each two kettles. The elevators discharge to a refuse scalping screen to remove any foreign matter that might have accumulated in the processing.

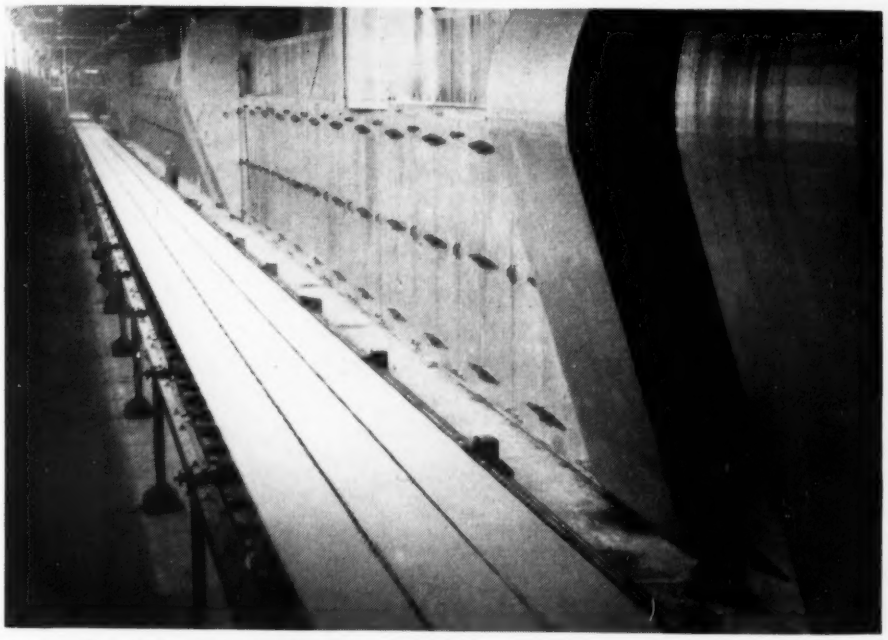
The calcined gypsum referred to in the trade as "stucco" can go to several outlets for further processing, as outlined below:

In a plant of this nature a large percentage of the output is for the fibered and unfibered plaster. Stucco which is going to be used for these plasters, is sent to the "regular" stucco bins for regrinding in the F. L.

(Continued on page 103)

Ample outside storage is provided, permitting operation of the plant during the Winter months

Tubular dust collectors on the fine grinding equipment are only one type of many dust collectors that make this plant practically dust-free



Some idea of the length of the wallboard machine may be obtained in this view

BIG CONSTRUCTION PROGRAM

Indicates Large Increase In 1948 Business

Higher freight rates, demands for wage increases, election year, and foreign situation mentioned as uncertainties affecting profitable operation

ALL RECORDS for attendance were shattered when approximately 1200 converged on the Netherland Plaza Hotel, Cincinnati, Ohio, the week of January 19 for the thirty-second annual convention of the National Sand and Gravel Association and the eighteenth annual meeting of the National Ready Mixed Concrete Association. The previous record was 750 persons at the 1942 convention.

The National Crushed Stone Association and its Agricultural Limestone Division held their annual meetings the following week (reported elsewhere in this issue), resuming prewar practice of having a machinery exposition in connection with the conventions. Not only did each of the annual meetings have record participation by producers but the exposition, the first since 1942, was the largest and most comprehensive display yet held and drew great numbers of producers directly interested in plant operation to the conventions. The next machinery exposition will be held in 1950, likely at the Stevens hotel in Chicago and possibly at Cincinnati again, dependent upon arrangements soon to be completed, and will be on an alternate year basis thereafter. In the odd years, the several Associations will be free to select separate cities for their annual business sessions.

The National Sand and Gravel Association and the National Ready Mixed Concrete Association will hold their 1949 meetings at the New Yorker hotel, New York City, the week of February 11 and, in 1951, will meet at New Orleans.

At Cincinnati, there were no conflicting sessions of the two Associations and the arrangement provided special hours and evenings for inspection of the machinery displays. However, there were special meetings. The Ohio Sand and Gravel Association and the Ohio Ready Mixed Concrete Association held separate luncheon meetings. There was also a luncheon meeting for State and District Association officials for interchange of ideas among local group executives.

"Writing Collective Bargaining Agreements" was the subject of an open forum evening session, with Charles A. Horsky, counsel for the two Associations, and executive secretary V. P. Ahearn leading the discussion. The effects of the Taft-Hartley Act were considered in this meeting which was specially designed to assist members of both Associations who handle labor agreements.

The Manufacturers Division, National Sand and Gravel Association, held an evening business session and scheduled entertainment was confined to the reception to members by the Manufacturers Divisions.

"Smorgasbord" at manufacturers' cocktail party

Presiding Officers

RICHARD N. COOLIDGE, president of the National Sand and Gravel Association, was presiding officer for the opening session, January 20, of that Association. J. R. THOENEN, U. S. Bureau of Mines, University, Ala., presided over the second session, devoted largely to specifications and problems in the production of sand and gravel.

PAUL C. GRAHAM was chairman of a joint session which considered the outlook for construction and highway building, and Harris N. Snyder for a second joint session on the subjects of depletion and depreciation, the Taft-Hartley Act and new developments in federal labor policy.

THOMAS E. POPPLEWELL presided over a meeting devoted to consideration of car supply, railroad freight rates and the effect of characteristics of aggregates on the properties of concrete, and A. R. SHIELY was presiding officer for a joint luncheon of the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

Officers

T. E. POPPLEWELL, Fort Worth Sand and Gravel Co., Fort Worth, Texas, was elected president of the National Sand and Gravel Association; H. N. SNYDER, The Buffalo Slag Co., Buffalo, N. Y., vice-president; and A. R. SHIELY, Guaranteed Concrete Co., St. Paul, Minn., secretary-treasurer.

W. AGNEW BLISS, Pittsburgh, Penn.; George W. Renwick, Chicago, Ill.; Eric W. Ryberg, Salt Lake City, Utah; and Robert H. Baker, Chattanooga, Tenn. (newly elected) comprise the executive committee. Re-

elected members at large of the Board of Directors were Charles E. Brady, Lilesville, N. C.; Floyd C. Fuller, Portsmouth, Ohio; J. P. Eyre Price, Scranton, Penn.; Eric W. Ryberg, Salt Lake City, Utah; and Stephen Stepanian, Columbus, Ohio.

A. E. CONOVER, Robins Conveyors Division, Hewitt-Robins, Inc., Passaic, N. J., was elected chairman of the Manufacturers' Division, succeeding E. J. Goes, Koehring Co. C. O. Friend, Nordberg Manufacturing Co., Milwaukee, Wis., and J. C. McLanahan, McLanahan and Stone Co., Hollidaysburg, Penn., were elected vice-chairmen of the Division, to serve with E. C. Anderson, Kensington Steel Co., Chicago, Ill; Morgan R. Butler, Butler Bin Co., Waukesha, Wis.; R. C. Johnson, Simplicity Engineering Co., Durand, Mich., and W. W. King, The W. S. Tyler Co., Cleveland, Ohio. Newly elected to the Board of Directors were Richard D. Ketner, General Electric Co., Schenectady, N. Y.; L. C. Mosley, Marion Power Shovel Co., Marion, Ohio; and D. M. Blackburn, Hendrick Manufacturing Co., Carbondale, Penn. Mr. Conover and Mr. Goes represent the Manufacturers' Division on the Board of Directors of the National Sand and Gravel Association.

Ladies' Entertainment

A program of entertainment for the ladies was sponsored by the Ohio Sand and Gravel Association and the Ohio Ready Mixed Concrete Association. Scheduled events included a trip to the WLW radio station to witness Ruth Lyon's "Morning Matinee" broadcast, a short tour of the radio station "behind the scenes" and a sightseeing tour by bus. Visited were the Rockwood Pottery, Sterling Glass Co., Art Museum, Conservatory of Flowers, followed by a ride on the famous Mt. Adams Incline.

Manufacturers' Division

Manufacturers' Division, National Sand and Gravel Association, elected officers and held its business meeting the evening of January 20.

Much of the discussion was of future exhibits and planning well in advance for those displays to increase their effectiveness.

WAYNE KING, chairman of the resolutions committee, presented resolutions expressing appreciation of the Division to President R. N. Coolidge and the National Sand and Gravel Association and to V. P. Ahearn and his staff for their effort and cooperation in making the exposition a success. Other resolutions, all adopted unanimously, expressed appreciation to the hotel and for the arrangement for consecutive conventions with the National Crushed Stone Association, and the sorrow of the Division in the deaths of Bruce G. Shotton, Hendrick Manufacturing Co., and Mike Eiben, Northern Blower Co. Mr. Shotton was president of the Division in 1941 and Mr. Eiben, while a non-member, was considered a close friend of the Division.

Left to right: Frank Carroll, John D. Gregg, V. P. Ahearn, and Bob Mitchell

V. P. AHEARN paid tribute to these men and expressed his enthusiasm for a very splendid machinery display. It was voted to increase dues $25 annually.

Presidential Address

In calling to order the thirty-second annual convention of the National Sand and Gravel Association, President Richard N. Coolidge, commented on the status of the industry, accomplishments of the Association, and the business outlook for the industry and the nation.

The Association now has 183 active member companies, a net gain for the year of 9½ per cent, and 58 associate members representing a gain of 14 per cent. Financially, it is in excellent position. Mr. Coolidge was outspoken in his praise of Stanton Walker and V. P. Ahearn for their part in making the Association of high value to the industry and in building for it prestige both inside and outside the industry.

He enumerated the many accomplishments of Mr. Ahearn and Mr. Walker during 1947 and publicly thanked the University of Maryland for its splendid cooperation in furthering the research program of the Association. The short course for technicians under the direction of Mr. Walker was considered an outstanding success.

Retiring chairman, E. J. Goes of the Manufacturers' Division, N. S. & G. A., with the new chairman, A. E. Conover

In commenting on general conditions as they affect business, Mr. Coolidge considers the year ahead one of many complexities and uncertainties which present fundamental problems that bear study by those who would guard against events that might threaten the nation's economic system. He considers indifference as the only thing that can destroy us. While he agrees that we can have rules to guard against exploitations and faults of unscrupulous employers and labor leaders, he cautioned that with a controlled economy as is desired by some planners freedom will be restricted in direct proportion to the number of controls.

He recommended that American employers see that their policies encourage four ideals: (1) high wages based on high productivity with incentive to encourage superior performance and output; (2) working conditions that safeguard the health, dignity and self respect of the employes; (3) employment that is stabilized to as great a degree as possible; and (4) a spirit of cooperation between employes and management with mutual respect for each other's rights and problems. He emphasized, in criticizing communistic teachings, that American enterprise has proved that it is possible to make more money, pay higher wages and reduce costs all at the same time.

This being an election year, 1948 will not be a year of decisions but one of legislative compromise, in his opinion. President Truman's proposed $40 income tax was characterized as a politically expedient proposal. A major reform in our tax system must come, he said, because the capitalistic system cannot successfully operate under the existing tax system which has required some large, efficient companies to borrow from banks for working capital.

In reviewing the past year, he said that most members of the sand and

gravel industry had a profitable year but that the element of inflation distorts the figures to an extent that it is difficult to know just how much real profit was made. As to the Marshall plan, his opinion is that the question of our ability to fulfill the long term phases of that plan should be definitely proven before we risk the violent economic reaction in this country that will result. The controls that will be invoked over business should the plan be adopted will threaten the free enterprise system.

As to the Taft-Hartley Act, he gave credit to employers over the country for not having used the law injudiciously, but he emphasized that industry should stand firm in its refusal to bargain away the rights accorded by the Act to workers, management and the public.

It is highly probable, in Mr. Coolidge's opinion, that 1948 will be another boom year. As proof of his claim that the best cure for inflation is production, he pointed out that the sand and gravel industry has had less percentage price rise than any other important industry. Sand and gravel production increased between 10 and 15 per cent in 1947 over 1946 when 192 million tons valued at $148 million were produced, he said, quoting U. S. Bureau of Mines figures. The estimated volume in 1948 is 215 million tons.

Executive Secretary's Report

EXECUTIVE SECRETARY V. P. AHEARN, in his annual report to the National Sand and Gravel Association, commented on a vast number of industry problems considered during 1947, discussed the outlook for business, and outlined possible federal legislation action and the effects restrictive laws would have on the industry. His report was one of the most comprehensive he has yet presented before the Association.

Since 1941, price increases for the industry over-all have totalled only 5.1 per cent according to Mr. Ahearn. Housing construction in 1947 was the

(Continued on page 94)

F. E. Popplewell, Fort Worth Sand & Gravel Co., Fort Worth, Texas, explaining a problem to G. W. Garrett, Stewart Sand & Material Co., Kansas City, Mo.

MACHINERY EXHIBIT

(1) **George Haiss Manufacturing Co., New York City.** Principal attraction was a sound motion picture, in color, showing various loader models in operation. Two enlarged photographs of loader installations were mounted on the backdrop. **Insley Manufacturing Corp., Indianapolis, Ind.** This booth contained a round-type Insley ½-cu. yd. crane concrete bucket with two large photographs of power shovel and dragline operations on the backdrop. **Conserco Co., Washington, D. C.** A large photograph of the company's mixer trucks for ready mixed concrete delivery in the operation of a leasee in the East was displayed. Smaller photographs of typical jobs being serviced by trucks of the Conserco fleet also were shown. **Bell Aircraft Corp., Buffalo, N. Y.** Two commercial units of the company's Prime Mover, a powered material handling bucket; one, completely equipped, and the other a cut-away chassis showing the working of the 3-hp. gasoline motor were displayed.

(2) **Nordberg Manufacturing Co., Milwaukee, Wis.** An automatic slide projector, featuring three shows of different types of equipment: Jaw and gyratory crushers; Symons cone crushers; and Symons screens, was the outstanding piece in this booth. The backdrop carried large photos of Nordberg equipment in operation. **Bucyrus-Erie Co., So. Milwaukee, Wis.** Backdrop in this booth was formed by a large architectural plywood wall with inset to provide ample lighting for an enlarged photo of the manufacturer's equipment in actual operation. Flanking the center picture were two smaller colored action photos.

(3) **The Thew Shovel Co., Lorain, Ohio.** A large, brightly painted plywood sectionalized wall formed the backdrop for this booth, with six colored transparencies each recessed in a separate compartment. Photos were of actual jobs in progress with either shovel or dragline attachments; and with the same subject carried out in three large photographs on either side of the central panel. **McLanahan & Stone Corp., Hollisdaysburg, Penn.** A large wooden model cross-section of a log washer, turned by an electric motor, was mounted on the backdrop to attract attention (in the second week, this was changed for a model of a single roll crusher). On one side of the booth was a 4-ft. model of the company's latest log washer.

(4) **Precision Instrument Sales Co., St. Louis, Mo.** Large panels carrying 50 concrete and other construction material ingredient calculators formed the backdrop for this booth. Other slide rule calculators on exhibit included those as intricate as the log log trig rule. **White Truck Co., Cleveland, Ohio.** Nine large photographs were presented on walls of the booth showing typical mixer or agitator body mountings on both 4- and 6-wheel chassis.

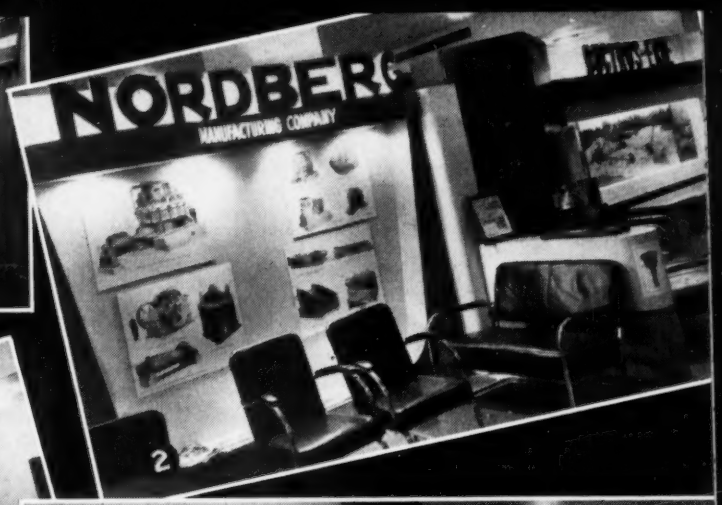
(5) **Screen Equipment Co., Buffalo, N. Y.** Striking feature of this booth was a large panel, mounted on an easel, with each letter of the word SECO carried by a separate disc, activated to resemble the movement of a Seco vibrating screen. **Lima-Hamilton Corp., Lima, Ohio.** Lima Shovel & Crane Division. Centered on the backdrop in a recessed panel was a large colored photograph of a typical sand and gravel plant with a swing conveyor being loaded by a new 1½-cu. yd. Lima clam shell.

(6) **The Master Builders Co., Cleveland, Ohio.** An actual working Pozzolith dispenser complete with pump and two tanks to show operation shared interest with a display of equipment used in ascertaining air-entrainment and dispersion by a field testing-laboratory technician. **General Electric Co., Schenectady, N. Y.** A continuous showing of a colored sound movie, "Clear Water," depicting the need for water purification, was featured in this booth for both weeks.

(7) **American Manganese Steel Division** of The American Brake Shoe & Foundry Co., Chicago Heights, Ill. A ¼-scale working model of a belted design Amsco dredge pump was set up in the booth (an Amsco plug-welded manganese lightweight steel dipper replaced the pump model for the second week of the show). **Stedman's Foundry & Machine Works, Aurora, Ill.** Interest here was focused on a glass-covered table fitted with sections containing samples of crushed rock and manufactured sand.

(8) **American Hoist & Derrick Co., St. Paul, Minn.** Mechanically projected slides, in color, showing job installations of hoists, clam shells, drag lines and cranes were the chief feature at this booth. **Eagle Iron Works, Des Moines, Iowa.** A 3-ft. working scale model of a Swintek dredging ladder, complete with gear box and dredge pipe, was part of this exhibit. Mounted on the backdrop were three large photographs of company equipment.

(9) **Koehring Co., Milwaukee, Wis., and C. S. Johnson Co., Champaign, Ill.** Two booths devoted to the Koehring earth-moving line and its subsidiary of Johnson overhead bins and weigh-proportioning systems were one continuous exhibit. Backdrop for this multiple booth was made up of two large colored transparencies, one of a batch plant and the other of a Dumptor in action. **Simplicity Engineering Co., Durand, Mich.** Almost filling this booth was a 3- x 6-ft. double deck vibrating screen, with direct connected motor and provision for either floor or suspended mounting.


NORDBERG
MANUFACTURING COMPANY

THE
NEW SHOVEL
COMPANY
LORAIN

PRECISION INSTRUMENT SALES CO.
White

SCREEN EQUIPMENT COMPANY
BUFFALO, NY
SECO
VIBRATING
SCREENS

GENERAL ELECTRIC

EAGLE IRON WORKS

NORTHERN
NOEHRING
JOHNSON

L. E. Stogentin, explaining pump details to J. H. Evans of Sturm & Dillard

E. J. Nunan, Buffalo, N. Y., discussing screens

J. P. Eyre Price and W. E. Price, his son, Scranton, Penn.

C. W. Purdy and J. R. Purdy, Killbuck Sand & Gravel Co.

highest in history because controls were removed. Construction volume was $15 billion put in place, which exceeded 1946 by 28 per cent and the 1942 previous all-time high by 6 per cent. In analyzing these totals, Mr. Ahearn expressed as encouraging the fact that some 80 per cent of the total was privately-financed. Of the total in 1947, $3 billion of construction was public works and some $900 million was expended for road construction, of which $640 million was federal money. Travel is now at an all-time peak on the highways with some 37 million vehicles in service. Mr. Ahearn mentioned the bill that has been introduced to Congress to continue the federal aid program starting with the next fiscal year.

The Shippers Advisory Board has estimated that car loading of sand and gravel will be up five per cent in 1948 but, he qualified, that availability of car supply may limit the total. Car shortages were serious in 1947 and particularly in the South and Southeast states. It was predicted that transportation controls might be invoked stemming from power already invested in the president, which would have possible serious effects on the industry. While there is no such thing as a non-essential industry, said Mr. Ahearn, the sand and gravel industry is considered in that category by some probably because of their widespread availability.

In discussing freight rates, Mr. Ahearn said that unless arbitrary increases are stopped the industry would be severely handicapped. His attitude is that since the industry produces a $50 million volume of business annually for the railroads, that carriers should be interested in preserving that business. There is a declining percentage of sand and gravel moved by rail now because of high freight rates. Yet, he believes the rates will be increased to still higher levels.

Mr. Ahearn, in commenting on the safety competition, stressed the part that safe working conditions play in public relations and employe relations. Safety, he said, should be the responsibility of principal executives. He stressed that safety is good business, since a safe plant is an efficiently operated one, and mentioned the increasing public interest in safe working conditions. He deplored the fact that participation in the contest was inadequate. Seventy-four plants participated in the 1946 competition as compared to 68 in 1945 and 55 in 1944.

Among the various published material prepared during 1947 were mentioned the booklet on cost accounting practices and survey on wage practices which were keyed to be of assistance to individual companies. Also, labor contract information was prepared in order to help companies make decisions that are sound in labor agreements. Mr. Ahearn was gratified to see that some of the labor contracts in the industry include certain recommendations made by the Association.

On the legislative front, the Association has been active in work on the Portal-to-Portal Act and the Taft-Hartley Act. The latter Act is not slave labor legislation as branded by some, said Mr. Ahearn, and will not be repealed. If amended, the opinion was expressed that the Act would be made more restrictive. The majority of Congress is in favor of increasing minimum wage standards but that legislation might not get to Congress, he said. If Congress undertakes a consideration of excise taxes, there is possibility that the three per cent transportation tax on vehicles for hire may be eliminated. Mr. Ahearn has testified for its repeal.

There will be personal income tax revision, he predicted, and steel will probably be allocated and possibly oil. Gas rationing is expected in April. In anticipation of steel allocation he suggested that the industry undertake plant rehabilitation immediately and that a reasonable inventory of repair parts be built. While Congress is opposed to limitations on wages and hours, even that might happen, in Mr. Ahearn's opinion, if conditions become unfavorable. Efforts will be made to reimpose price controls. If steel is allocated, related cars and coal may be and the danger is that the ultimate will be control over everything.

Acceptance of the Marshall plan will accelerate these conditions because of the shortages that will develop, which mean regulation. The year 1948 would be the biggest year for sand and gravel used in construction of all time but for all these contingencies in his opinion.

In conclusion, Mr. Ahearn said that he hoped the series of membership meetings conducted in 1947 could be continued in 1948. He credited the membership for the Association's growth and urged that individual companies keep on selling the Association the way they have.

Cost Accounting Luncheon

JOINT COMMITTEES on cost accounting for both the National Sand and Gravel Association and the National Ready Mixed Concrete Association met for a noon luncheon on Tuesday, January 20, under the joint guidance of Vincent Ahearn and O'Neal Johnson for informal discussions. However, before the discussions got under way, typed copies of the preliminary manual, or cost accounting outline for both industries were given all those in attendance. It was explained that this preliminary manual would be later followed by a more complete classification and outline of the accounts, and a more complete clarification of their meaning. Discussion revolved around technical points, such as, what constituted repair materials and what constituted supply materials. Those present gave their company's procedure

but it was finally decided that further amplification of these technical points would be carried out by correspondence and the information so gathered would be incorporated in the more complete manual to follow. Those in attendance were: Vincent Ahearn; O'Neal Johnson, Cost Accounting Committee consultant; R. K. Humphries, Pacific Coast Aggregates, Inc., San Francisco, Calif.; P. J. Kremer, The Buffalo Slag Co., Buffalo, N. Y.; John W. Murphy, Union Sand & Gravel Co., Spokane, Wash.; H. H. Kerwin, Eastern Rock Products; S. E. Honey, Stewart Sand & Gravel Co., Kansas City, Mo.; Frank Emerson, Graham Bros, Inc., Los Angeles, Calif.; and R. M. Hart, Rinker Material Co., West Palm Beach, Fla.

In the report of the committee on a cost accounting system for the sand and gravel industry, O'Neal M. Johnson, committee consultant, outlined the many benefits attainable through knowing in detail all items of cost. A good cost accounting system will provide a running story of all costs from the beginning of production through to the delivery of materials. It will be the means of determining whether certain products are profitable, records of supplies used in production, provide a check on the efficiency of the sales department, aid in making out income tax returns, help in the anticipation of requirements ahead, break down the relative costs chargeable to the several products marketed and provide a basis for price and cost adjustments.

If a company has no breakdown of production costs, he said that probably 85 per cent of the work needed for a complete record is already being done anyhow. Some companies had been on the verge of bankruptcy until cost accounting had been adopted, he said, in emphasizing its value as a tool of business management.

Safety Awards

V. P. Ahearn announced the winners of the 1946 safety competition, for which Rock Products awards two trophies, one for the winner in the more than 100,000 man-hour size classification, and the second for the best record with less than 100,000 man-hours worked.

Robert Mitchell, president of Consolidated Rock Products Co., Los Angeles, Calif., and Frank Carroll, superintendent of Consolidated's Irwindale plant, winner in the large plant classification, were present to accept the trophy.

In accepting the award, Mr. Mitchell urged every producer to enter all plants in the safety competition, pointing to the fact that safety is not only most desirable but actually a cost-saving practice. His company now is possessor of four of the trophies awarded, since 1936, and the separate plants of the company are in spirited competition with each other for the best safety record. It is company practice to reward the superintendent of a winning plant in the industry competition with a trip to the national convention. Mr. Mitchell, in introducing Mr. Carroll, offered a challenge to the industry by predicting that Mr. Carroll might well be in New York a year hence to accept another trophy unless the industry safety record is improved in 1947. John Gregg, builder of the plant, was introduced to the convention.

Paul C. Sudhoff, superintendent of American Aggregates Corp.'s Raymond plant, Indianapolis, Ind., accepted the second trophy. He gave much of the credit to W. E. Hole of his company for the safety program at his plant.

DURABILITY of Aggregate

Engineering Director's Report

Engineering Director Stanton Walker outlined the principal current problems of production and use of sand and gravel and summarized the researches underway and to be undertaken in the solution of industry problems.

Durability of concrete was mentioned as the problem of leading importance, in which aggregates are importantly involved, as are cements and other factors including the proportioning and construction methods. Accordingly, the largest proportion of laboratory work by the Association at the University of Maryland has been devoted to freezing and thawing tests of concrete. A large number of different aggregates, principally gravels, have been tested under different variables and over a period of several years. According to Mr. Walker, data accumulated support the wisdom of the current trend to pay more attention to drainage of water away from concrete structures. Further work is needed before tests may be used to fix safe limits of quantities of unsound or soft and friable particles.

Tremendous differences have been found in resistance of different cements (in concrete subjected to freezing and thawing) tested at the same time and in different lots of the same cement tested at different times. It is suspected that the principal difference in many cases may be due to relatively small and difficult-to-measure differences in quantity and distribution of entrained air in concrete nominally considered to be "air free."

Air entrainment in concrete, according to Mr. Walker, improves the ability of concrete to resist freezing and thawing, in terms of several hundred per cent. Entrained air offers promise of compensating for the deficiencies of certain aggregates contributing to lack of resistance and there is evidence that some aggregates which would be considered as unacceptable or borderline in normal concrete may be used with confidence in concrete containing entrained air. Apparently, the benefits to fine aggregates are more widely distributed than for coarse aggregates.

In considering other destructive agencies, Mr. Walker said that there is promise that entrained air will improve materially resistance to alkali solutions but not likely in the case of acids.

The problem of differences in thermal coefficients, absorption and, more importantly, volume changes due to moisture, and their influence on concrete subjected to wetting and drying and heating and cooling has been attacked to a limited extent in the laboratory.

Alkali reactivity is another problem under study. The question, posed by Mr. Walker, is whether the solution is merely to limit the alkalies in cement to some such figure as 0.5 or 0.6 per cent and whether that would represent only a delaying action or whether the solution might be to find some additional ingredient for concrete which will "use up" the alkalies and thus prevent the expansion which results in disruption. Laboratory evidence, he said, seems to point to the phenomenon being limited to a few aggregates in combination with cements containing alkalies in excess of about 0.6 per cent.

In his comments on bituminous mixtures, Mr. Walker stated that a larger proportion of the aggregates so used are sand and gravel than ever before.

Safety Trophy won by American Aggregates Corporation on display in ROCK PRODUCTS booth

Left to right: Nathan C. Rockwood, ROCK PRODUCTS; R. N. Coolidge, Cumberland Sand & Gravel Co., president of the N. S. & G. A.; and A. R. Shiely, J. L. Shiely Co., standing

The principal problem lies in the adhesion of the bitumen to the aggregate, poor adhesion being due to unfavorable characteristics of either the aggregates or bitumen or both. Various treatments for both are being investigated and show considerable promise. Open mixes of the cold and slow-curing types are likely to be more susceptible to attack than the hot and fast-curing ones. Dense hot mixes are most likely to exhibit good adhesion even with hydrophilic aggregates. Basic rocks, which include the limestones, are generally favorable for adhesion while a good share of siliceous aggregates are likely unfavorable which means that a larger proportion of hydrophilic (unfavorable) aggregates are among gravels than competitive materials. The solution is to promote the use of gravel in types of mixtures where the problem of adhesion is minimized.

Mr. Walker commented briefly on the Simplified Practice Recommendation specification, under revision now, and recommended favorable consideration of the proposed changes by the industry. Problems of production for quality—the elimination of deleterious particles, uniformity of product, retention of minus 50-mesh and 100-mesh particles, etc.—were briefly considered. A.S.T.M. requires that sand grading be such that the fineness modulus not vary more than ± 0.20, which is practical with care in production but the War Department limit of ± 0.10 is so rigid that Mr. Walker questions the ability to conform with regularity unless by blending two sands at the mixer. As to fines, he said that the minimum requirements, minus 50-mesh, will be 10 per cent. He believes there will be less emphasis on requiring very much minus 100-mesh fines as more widespread use of air entrainment is made.

Mr. Walker commented on the arrangement whereby researches are conducted at the University of Maryland. The National Sand and Gravel Association Research Foundation is maintained at the University. The National Ready Mixed Concrete Association has cooperated in research the past four years, utilizing the same equipment and staff and sharing in the expense of the work. As part of his report, Mr. Walker appended a joint account of investigations prepared by Fred F. Bartel, assistant director of engineering, and D. L. Bloem who is in charge of the laboratory work.

Our Dynamic Way of Life

A. R. SHIELY was presiding officer for a joint luncheon of the two Associations on Wednesday, January 21, which featured a very excellent and forceful address on "Our Dynamic Way of Life" by ROBERT S. WILSON, vice-president, Goodyear Tire and Rubber Co.

The essence of Mr. Wilson's address was that the greatest threat to America's dynamic way of life is from within, not without. Included among those "threats from within" cited by Mr. Wilson were:

Tax policies which penalize initiative and drain the source springs of private capital; labor policies which encourage more pay for less production; foreign aid policies which overstrain our capacities and resources; and the tendency toward ever greater concentrations of power in government with the resultant diminution of personal freedom.

If we are vulnerable, it is only because there is confusion, unenlightenment, absence of comprehension and misunderstanding which he said are the weak spots in the nation's armor which must be corrected.

Mr. Wilson strongly defended industry's position and cited its accomplishments to refute charges that business is on trial as many so attack it. The tinkering theorist is the fellow who will bear watching, he said, in warning that a lot will be seen of him during this campaign year.

Photo by Fabian Bachrach

R. S. Wilson, speaker at luncheon

Appointed Honorary Director of N.R.M.C.A.

Mr. Shiely, in introducing all individuals at the speakers' table, paid special tribute to NATHAN C. ROCKWOOD, for many years editor and now consulting editor of ROCK PRODUCTS. Mr. Rockwood had been appointed an honorary member of the Board of Directors of the National Sand and Gravel Association at its Summer meeting and had been similarly honored the day of this luncheon by the National Ready Mixed Concrete Association. After Mr. Shiely's introduction, the entire audience rose and applauded Mr. Rockwood. Mr. Shiely had said:

"To present the next man I am going to introduce gives me greater pleasure than anything I can possibly think of. He is the only man who has become an honorary member of the Board of Directors of the National Ready Mixed Concrete Association, and the second man to be so honored by the National Sand and Gravel Association. The National Ready Mixed Concrete Association, as you know, has 18 years of age behind it, while the National Sand and Gravel Association has 32 years, so you can appreciate what a real honor this is.

"I could give you a world of things about Rocky's achievements during his life but I would rather talk to you about the man. To know Rocky is to love him. I think he has more friends in this industry than any other individual, and no enemies. In spite of all the great things that he has done, he still has that humility that goes with men of great stature. It has not swelled him in any shape or manner.

"I might sum the whole thing up by saying to you that he is one of God's noblemen, and that he can answer truly to the name of gentleman. I give you 'Rocky' Rockwood!"

SAND on Top of Ballast

CONSIDERABLE COMMENT was aroused by the speaker, H. W. PROTZELLER, consulting engineer, railway equipment division, Nordberg Manufacturing Co., who presented some very new, novel and somewhat radical ideas on his interpretation of what constituted the best railroad ballast. Basically his idea was to place a considerable thickness of sand, under certain conditions, on top of the ballast. Inasmuch as this revolutionary idea was arrived at after a large amount of research work by his company we will here go more deeply into his paper.

The first step in this program was the development of the Nordberg Ballast Analyzer. This is a portable machine that can be used at the track or in a pit. Essentially it is designed to make a screen analysis, from 3-in. down to 1/10-in. gradation and has accessories so the operator can determine the amount of dirt and other foreign matter in the ballast. It also determines the percentage of voids, the weight of either the ballast aggregate or dirt, or the combination in pounds per cubic foot.

Dirt Is Destructive Agent

He pointed out that it is an accepted fact that dirt and debris in ballast is the destructive agent that materially weakens the ballast element as a whole and particularly so when dirt and water are found together. Hence, he said, that the key-note to improvements in ballast revolved around a better knowledge of the dirt and foreign matter therein.

The speaker said that the destructive matter in ballast was from nine sources. The listing that follows is not in order for they vary from location to location. They are: (1) locomotive droppings; (2) droppings from coal cars; (3) droppings from gondolas such as sand cars; (4) locomotive driver sands, pulverized; (5) cattle car and toilet droppings; (6) top soil blown in from adjacent fields; (7) pulverized or weather ballast; (8) sub-grade material that worked upwards; and (9) salt from refrigerator drippings.

Chemical analyses of the ballast's fines helped determine the source; for instance, high carbon indicated excess cinders or coal droppings.

Types of Ballast

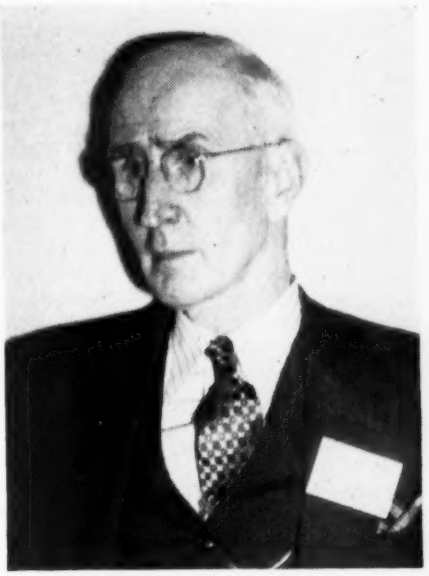
He said that his company had conducted hundreds of tests on many different railroads and had arrived at certain fundamental conclusions and had classified the wide number of types of ballast into just two classes; crushed stone and prepared gravel. He pointed out that there was a wide divergence in types of rock ranging from softer limestones to hard trap rock. Even the top size of rock was subject to a wide difference of opinion. Some railroads, he pointed out, will not use rock where the maximum top size exceeds ¾-in. Others want a maximum of 3-in. with everything below 1-in. thrown out. Each school claimed big advantages. Most of the adherents to the school of thought who claim that "through the ballast drainage" is the most desirable feature and that open voids give this to greater extent. The speaker said that from research this claim was basically wrong and that ballast with a large amount of voids simply permitted the surface water to penetrate to the subgrade where it does a great amount of damage.

In support of his thesis he pointed out that ballast must take the shock loads of high speed, heavy traffic and distribute it to the subgrade. Subgrades usually are much less stable when wet than when dry, hence one of the prime requisites of ballast is to prevent this water penetration. It is equally important, he said that water below be prevented from rising into the ballast. Two natural forces control the flow of water in ballast: gravity and capillarity. In the latter it is always from the wet to the dry areas. In any form of ballast where the bottom size is ⅜-in., open voids will account for 38 to 42 per cent of the total ballast space and since capillary action is confined to the small pores or spaces, a clean ballast with open voids effectively prevents capillary action but this does not prevent the downward flow of water.

Controlling Water Flow

The speaker then came closer to the crux of his findings by pointing out that one of the most effective means of stopping gravity flow of water in ballast is by the adhesion of water to the stone and that if two particles of stone touch a certain amount of water will be retained around the points of contact. Since the more points of contact the more water the ballast will hold, the research program developed a ballast that would hold the maximum amount of water. To do this, as one part of the program they developed a simple means of determining the amount of water held in ballast and he divided this into three divisions: (1) the water absorbed internally by the stone; (2) the water on the surface of each individual stone (surface adhesion); and (3) the water held at the points of contact. In general the internal water runs from one to seven per cent by weight and the surface adherence from one-half to three per cent. Gravel aggregates averaged a total of 2½ per cent for both internal and external water.

Otto Kuehne, Jr., Kansas Sand Co., Topeka, Kans.



C. C. Deal, Deal Gravel Co., Elkhart, Ind.

G. G. Hill, Dexter, Mo., examining crusher

L. W. Shugg, Director of Exhibits

His test work showed that regardless of the size of the stone making up the ballast mass, from ¼-in. to 1½-in., the adhesive water held in suspension was quite uniform and ran around 5 per cent by weight. Water from 7 to 8 per cent of the mass weight may be held when the individual pieces are of uniform size, and not less than ¼-in. Their experiments indicated that for test purposes, the ideal mixture would be a mixture of five sizes of aggregate with equal weights of each size, the total mixture of which provided the maximum weight per unit of volume and when using this mixture they found that the adhesive water held in suspension was approximately twice as much as for the uniform sizes, or the total water held was from 12 to 15 per cent of the entire ballast weight. At the same time this mix increased the number of load carrying points of the ballast, and pointed out that the greater the number of load-points of the ballast, the less the load carried by each point. This in turn would permit a softer stone to be used without undue abrasion losses. High load-point carrying capacity also made the track more resilient, he said.

Adhesive water could be increased by lowering the amount of voids. The five size, graded ballast mixture reduced the voids to 33 to 36 per cent for gravel and 38 to 41 for fractured stone. He reasoned the easiest way to increase the points of contact and reduce the voids was to apply sand to the ballast. He pointed out that here were two diametrically opposed ideas; namely, to hold as much water in the ballast as possible and at the same time reduce capillarity. If a ballast is filled with dirt and fines and compacted, the vibratory action of the passing wheels tend to pump sub-grade water to the surface and in some cases lifted water as much as 20-ft. His tests aimed at a ballast that would hold the maximum amount of water and just fine enough that the maximum capillarity would be from the *sub-grade line* to the ballast surface.

He said that generally speaking, with a minimum of ¼-in., that by any manner of grading or compacting it was impossible to reduce the voids below 33 per cent. However, if the voids in this mass be filled with sand of certain gradation, desirable results were attained. As an illustration he mentioned one sand that weighed 112 lb. per cu. ft. and had 28 per cent voids. The above graded coarse aggregate of 33 per cent voids would hold 37 lb. per cubic foot of sand, thereby increasing its weight that amount. This would reduce the voids to a theoretical 9⅓ per cent, but in actual practice the voids were reduced to around 12 per cent, he said. This approached the ideal ballast, in his opinion.

He said that dry sand-filled ballast of crushed stone or graded gravel bedded 12-in. deep would hold all the water from a 1-in. rainfall, 70 per cent of a 2-in. rainfall, and 50 per cent of a 3-in. rainfall. Now, capillarity will raise water to a height of 2 ft. very rapidly, and evaporation tests showed that water in ballast on average days would evaporate at the following rates: From a 1-in. rainfall in 16 to 18 hrs., 2-in. in 30 to 36 hrs., and 3-in. in 48 to 60 hrs. and that this did not dry out the ballast mass entirely, but that around 80 per cent of such water did evaporate in the times indicated. He also pointed out that sand filled ballast is just as strong when wet as when dry which is not true of mud or dirt filled materials.

Then the speaker went into the matter of cost of ballast pointing out that the day was past when first cost was the prime consideration. He said the average single track contains around 3000 cu. yd. of ballast per mile. Tamped under the ties it would cost $4500 per mile for pit run gravel, and for the best types of crushed ballast, the cost tamped under the ties would be $12,000 per mile. He then asserted that a superior graded ballast of 1½-in., 1¼-in., 1-in., ⅝-in. and ⅜-in. of each size by weight, thoroughly cleaned and mixed before loading and applied to the track in that form, and then followed by putting a suitable sand to the amount of from ¼ to ⅓ of the total weight of aggregate would provide a superior ballast, tamped under the ties for around $8000 per mile.

J. W. Hobeck, Rock Sand & Gravel Co., Grand Rapids, Mich.

He said that addition of crushed or angular pieces to ballast was not too necessary provided the ballast is graded as to size. He stressed the necessity of placing the coarse ballast first and then placing the sand on top, stating that this was an entirely different procedure than just using pit run materials. He also pointed out that ballast has a material influence on the life of service of ties, rails, and rail fastenings, etc., and that material savings would occur to the railroad from proper ballasts.

Mr. Protzeller then went on to explain that the sand placed on top of the coarse ballast worked downward and even penetrated the subgrade and helped stabilize it. Speaking of the sand to use, he said, "In general it should be sharp and of free-flowing character. All of it should pass a ¼-in. square opening, and not more than 15 per cent retained on a 1/10-in. square screen. On the fine side, not more than 5 per cent should pass through a 1/50-in. square opening screen. Between these maxima and minima, the more even the gradation the better."

He called attention to the practice of some railroads to raise the track a few inches, apply a veneer of new ballast and call it a job. With the increasing number of highway overhead crossings, overhead structures, etc., the railroads are limited as to height of track raising. He pointed to the necessity of removing old ballast and replacing it with larger and larger amounts of new material.

Discussion

During the discussion of this important paper Ray Warren, Pennsylvania Sand & Gravel Producers Association, asked about the gradation of the sand and the speaker replied that it was as follows on one particular application:

Minus	Per Cent
4-mesh	100
10-mesh	47.9
20-mesh	17.6
30-mesh	10.6
40-mesh	5.8
50-mesh	2.8
100-mesh	0.8

In answer to the question of Eric Ryberg, Utah Sand & Gravel Products Corp., the speaker pointed out that it was desirable to fill the voids (to certain limitation) as much as possible so that the resulting ballast, wet or dry was equally strong and resilient.

Ezra C. Knowlton, Utah Sand & Gravel Products Corp., asked about the amount of sand to use and was advised that it should be around 1000 tons per mile and in reply to questions as to the railroads' acceptance of this revolutionary idea, was advised that the speaker's company had 30 letters from chief engineers of various railroads approving the findings on test strips. The strips under test showed low silt content. R. T. Davison, J. K. Davison & Son, asked about the use of limestone dust and was advised that it was too angular and does not penetrate good unless fine and some limestones have a tendency to cement.

In reply to other questions the speaker said that 15 per cent through the 50-mesh screen and 2½ per cent through the 100 would not be too bad, but minus 200-mesh material in the sand was bad. He also said that the top size for the ballast should not exceed 1½-in. as the present day high speed trains required micrometer grades to be maintained within fractional inches and that with the 3-in. ballast this was difficult to do.

Basis of Purchaser Requirements

A PAPER was presented by R. R. LITEHISER, chief engineer, testing and research laboratory, Ohio State Highway Department, on "The Basis for Purchaser Requirements." He pointed out that purchaser requirements are not intended to fill the specifications with technicalities just to make them look formidable and when the purchaser is a state director of highways, all purchases must be made according to law. He brought out the increase in the number of materials and their specifications in Ohio from 1914 to 1947. In 1914 the specifications covered a total of 11 items for limestone, igneous rock, slag, sandstone, gravel and sand, and in 1947 there was a total of 23 for this same coverage. Again, in 1914 there were two specifications for gravel and four for sand, a total of six. In 1947 the total was 12. In 1914 the specifications were covered by a 16-page booklet; in 1947, 175 pages of about half the earlier size page or roughly 80 pages were required. Much of this increase was due to more different kinds of material but for the most part, the increase was due to quantitative descriptions of building materials. The speaker said, "The purchaser's desire has been to make the description of the material he wants to buy not only as clear as he can but to include in these descriptions, characteristics which can be measured."

Left to right: Paul Barhorst and Leo Barhorst, Spring Creek Gravel Co.; J. L. Shiely, Jr., J. L. Shiely Co.; Alvin Schulze, Spring Creek Gravel Co., and Harvey J. Wendler, Ft. Lorimie, Ohio

Specify Aggregates On a Concrete Strength Basis

C. E. PROUDLEY, chief material and test engineer, North Carolina State Highway and Public Works Commission, read an interesting paper on "Specifying Aggregates on a Concrete Strength Basis."

The speaker pointed out that the strength of concrete is influenced by several characteristics of the mineral aggregates for which no suitable tests have been devised. Particles in tension, shear, adhesion of the particle to portland cement, etc., were mentioned as some of these characteristics that are very difficult to measure. He said that some of the physical properties of aggregates, such as resistance to abrasion, weathering, etc., and their relationship to concrete are so indefinite that it has not been practicable to rely on them entirely. They only provided a boundary beyond which the risk of using the aggregate was too great.

He pointed out that economics play an important part in designing a mix and that often a richer mix with a relatively inferior type of aggregate might result in an over-all saving. He said North Carolina required 600 p.s.i. modulus of rupture at 14 days; a minimum cement content of 5.6 bags per cu. yd. and a maximum of 7 bags also was specified. If more than 7 bags are required it is made up by increasing the thickness of the pavement.

He next outlined the laboratory procedure for testing and for the design of the concrete. They first start with the testing of all portland cements likely to be encountered in the locality. The final proportions are then based on that cement which gave the *lowest* strength concrete at any acceptable age. He explained that for the purpose of bidding, the possibility of cement from the lowest strength source must be considered. Contractors, he pointed out usually wait until the last minute before expressing intentions as to sources of material which often precludes test work on higher strength cements so as to modify the design. He said that the change in cement content after the contract was let is of small interest to the contractor because the state pays for any additional cement and takes credit for any decreases.

John W. Roberts, Richmond, Va., left, visits with J. R. Thoenen, Bureau of Mines

He said that proportions for structural concrete vibrated into place are specified at 6 bags per cu. yd., and 3000 p.s.i. at 28 days is the minimum compressive strength permitted for the highest quality concrete. Aggregates from frequently used sources are re-tested at least once per year, and all combinations about once every three years.

Regarding sand, he said that a sand not meeting mortar strength requirements may be used provided the grading is satisfactory and the strength of concrete in which it is used is as good as concrete in which sand meeting specifications requirements was used.

He pointed out that designing concrete on a strength basis permits flexibility and the use of aggregates that otherwise might be rejected at economic losses.

In carrying out the basic idea of his thesis he said North Carolina prescribes a limit of 55 per cent on the Los Angeles wear test for coarse aggregate but materials having a higher loss may be used if a five-year service performance indicates its reliability.

He believes that the designed-strength specification was a step in the right direction. Some of the best concrete pavement in North Carolina, he said, has been made using aggregates of the soft, friable type and some pavements which have given not-so-good performance contained hard or so-called high quality aggregates. He thought improvement will probably be in the direction of more elastic concrete and concrete having low volume change characteristics.

Characteristics of Concrete Aggregates

J. F. BARBEE, engineer, concrete tests, testing and research laboratory, Ohio State Highway Department, described "Special Characteristics for Concrete Aggregates." The speaker reviewed some of the fundamentals of concrete, pointing out that air entrainment increased workability and permitted changes in fineness from former specification calling for 14 per

cent through the 50-mesh and 2 per cent through the 100, whereas now 10 per cent through the 50 and 1 per cent through the 100 gave comparable workability. He said air entrainment did not decrease pop-outs but did reduce their destructibility. Silt reduced strengths but had a favorable effect on workability.

Bituminous Aggregates

JOHN GOSHORN, assistant chief engineer, testing and research laboratory, Ohio State Highway Department, presented a paper entitled "Special Considerations for Bituminous Aggregates." He pointed out that it was the aim in bituminous road construction to make a stable, non-skid, water proof surface with a long life and little maintenance, and that the specifications for aggregates for such roads followed in a general pattern those for other types of roads, having in mind such requirements as grading, per cent wear, cleanliness, per cent crushed, etc. To this group, however, he included adhesion and swell. Lack of adhesion, he said, accounts for a large percentage of unsatisfactory results and that this problem has not been solved to date but is under study by many able groups.

Specifications called for an aggregate that when coated with the bituminous material the coating would not slough off in contact with water. This was wishful thinking, he said, as some of the incompatibility should be placed on the bituminous materials. However, he did point out that certain aggregates did have a high non-adhesive property and required concentrations of treating agents to secure proper adhesion. He then described the other characteristics of gravel and sand that are desirable for good bituminous work.

For seal treatments, choke aggregates and some plant mixes, he found small-sized short-graded aggregates generally specified. Also for seal treatments the requirement that the aggregate be 100 per cent crushed was not unusual. In drag treatments, road mixes and certain types of plant mixes the longer graded aggregates can be used advantageously, the maximum size depending upon the weight of the treatment. He found wide limits for bituminous concrete sand specifications satisfactory provided the source is uniform. Problems in grading can usually be readily solved by the producer, he said.

On the subject of hardness and soundness he thought that producers might use soft stone eliminators to advantage.

Robert Coe, Basic Construction Materials Co., Chillicothe, Ohio

Production Problems

STANTON WALKER briefly discussed some of the problems relating to the production of sand and gravel and their solution, mentioning that organic matter was not always removed. He told of the extensive use of soft stone eliminators and impact crushers to secure suitable products. In some instances, he said that hand picking could be used to advantage and that possibly the sink-float or Heavy Media Separation process would find use in the industry for the removal of coal and other lightweight materials. On sand grading, he said that air entrainment had relieved some of the pressure.

Owing to the time taken by the previous speakers the discussions were brief and sketchy, and Mr. Walker referring to Mr. Proudley's paper pointed out that standardized testing did not always give comparative results. Ray Warren asked about the concretes made with the higher L.A. rattler losses, and Mr. Proudley replied that some aggregates gave good results with 60 to 70 per cent loss but others did not, so they have lowered the figure to 55 per cent to discourage new deposits. Mr. Warren also asked about results of field surveys, and the speaker said that such surveys had been made and in one instance the 55 per cent material gave better results than one in the 15 per cent range but this latter operation was now out of business.

The meeting concluded with a moving picture, in color, showing the river dredging operations of the Keystone Sand Division of the Dravo Corporation.

Effect of Characteristics of Aggregates on Properties of Concrete

STANTON WALKER, engineering director, in his report discussed the "Effect of Characteristics of Aggregates on Properties of Concrete." He outlined the subject, dividing the characteristics into two large groups: (1) those on which sufficient knowledge is available to permit quantitative limitations as to specifications; and (2) those known to influence concrete but not so tangible as to permit specific limitations. He named the four main characteristics of aggregates: (1) soundness and durability; (2) hardness and strength; (3) sizing and grading; and (4) deleterious particles. His talk brought out the fact that if a source of material does not contain suitable particles not much can be done about it. He did point out that if these particles were limited in extent something could be done but there was a limit beyond which processing was uneconomical.

Mr. Walker discussed briefly the main four characteristics and their effect on concrete saying that improper proportioning methods were the greatest offender. He next showed a series of 13 slides to illustrate the many causes of concrete failures. Other slides were shown illustrating by graphs the effect of variations in the aggregate only. He pointed out that air entrainment was compensating for the deficiencies of certain aggregates. He showed a slide that gave results of tests for compressive strengths from a number of different crushed stones in which the compressive strength of the stone was determined. These latter ran from 5000 to 35,000 p.s.i. but that the compressive strengths of the concrete did not vary significantly. In regard to the mineralogical and chemical composition of the aggregates, Mr. Walker pointed out that in general, silicious aggregates have a higher coefficient of volume change than calcarous and certain igneous rocks.

Research Plans

In a very brief talk before a joint session of the two Associations, A. Allan Bates, vice-president, Portland Cement Association, outlined the research plans of his organization. He expressed the concern of the cement industry for some of the problems confronting the sand and gravel industry in improving the durability of concrete, because of the community of interests between the two industries. He pledged an intensified cooperative research program under the sponsorship of the Portland Cement Association.

In defense of criticism of the durability of concrete, he pointed to figures that show the enormous growth in the use of portland cement concrete as against other construction materials. In any criticism of concrete of comparative recent date, he said that consideration should be given to the fact that more than half of all the concrete since 1776 has been placed since 1930 and that a great deal of the older concrete has long ago been torn up. Thus, much of the evidence of comparative performance is unavailable. He also pointed to the fact that builders have, in recent years, been much bolder than hitherto in applications for concrete.

Editor's Note: A report of the National Ready Mixed Concrete Association convention appears in the Concrete Products section.

1948 Construction Program Up 7 to 25 Percent In Volume

SPEAKING before a joint session of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, THOMAS S. HOLDEN, president, F. W. Dodge Corp., estimated that there would be an over-all 7 per cent increase in dollar volume of building and engineering contracts for the entire year 1948 as compared to 1947. The increases predicted were 9 per cent for non-residential building; 4 per cent for residential building; and 7 per cent for heavy engineering construction.

These estimates admittedy may prove ultra-conservative and the over-all figure of a 7 per cent increase is in sharp contrast to the Commerce Department's estimate of a 25 per cent increase in construction activity. The 1948 estimate of Dodge, if it works out, will approximate a final figure (for the 37 states east of the Rocky Mountains) of $8,300,000,000, a slightly higher dollar volume total than that of 1942 which was the peak year of war construction and peak year in dollar volume of all time.

The figures are factual and represent work starting or about to start while, he said, the Commerce Department figures are estimates and calculated by allocating estimates of construction activity to future months.

The start of 1948 is with an unusually large carry-over volume of construction work in progress and, predicted Mr. Holden, the contract volume will be very heavy the first quarter and possibly through the second quarter. From his point of view, continuously increasing contract volume throughout 1948 is not only unlikely but undesirable since a continuously rising volume would constitute an inflationary boom. A moderate setback around the middle of the year to correct unbalances in market conditions would make for a far sounder situation in 1949, in his opinion.

Chester A. Hogan, Hogan Sand & Gravel Co., Poughkeepsie, N. Y.

Housing starts in 1947 were within 10 per cent of the 1925 peak volume and 1947 was much improved over 1946 in the elimination of delivery delays and other obstacles to continuous operation which retarded construction. In 1947, the number of housing completions was 93 per cent of the number of starts as compared to 65 per cent in 1946, indicating that substantial progress had been made in 1947. In one important aspect, 1947 progress was disappointing and that was the continually increasing level of commodity prices. About the only important deflationary factor in sight is a tightening of bank credit, said Mr. Holden.

The Highway Program

"The Highway Program Ahead" was the subject of a paper by HAL H. HALE, executive secretary, American Association of State Highway Officials. In speaking of the shortcomings of the highway building program, Mr. Hale said that 9800 highway engineers are still needed. As of 1947, he said that a billion dollars annually are required to maintain and administer the road system and that four billion dollars annually are required for all highway needs. Cost of building highways in the fourth quarter of 1947 is 197 as based on a composite index of 100 for 1940.

Total mileage of roads of all types is now 3,200,000 of which 231,000 miles come under the primary federal aid system. Also coming under the Federal Aid Highway Act of 1940 are 340,000 miles of secondary farm-to-market roads. The total of 571,000 miles under the federal system will be increased to 600,000 miles in two years. In allocating funds, the problem, he said, is to prevent their dissipation over too much work. The national system of interstate highways totalling 40,000 miles was briefly touched upon by Mr. Hale.

Of the 231,000 miles constituting the primary federal aid system, 110,000 miles are improved as measured by today's standards but 55 per cent of the mileage must be replaced within the next 10 years. Mr. Hale detailed the distribution of highway funds as to maintenance, non-highway building uses such as retirement of debt, policing, etc., to show how the highway dollar is distributed.

Of 44 states in legislative session in 1947, he said that 30 were in favor of increasing state gasoline taxes. Legislation has been introduced to Congress to extend the federal aid program, and long range plans envisage federal appropriations of $500 million annually indefinitely.

Depreciation — Depletion

A VERY clear and precise discussion of depletion and depreciation practices in the sand and gravel and ready mixed concrete industries was presented by ROBERT ASH, tax counsel for the two Associations before a joint session. Mr. Ash's discussion explained fundamentals to some degree because, as he pointed out, many people in the industry do not realize the nature of depletion and depreciation adjustments. Some specific dollars-and-cents examples were given to illustrate his comments, for the benefit of the uninformed.

As an example of deduction of depreciation for income tax purposes, he supposed a company's only asset was a truck purchased January 1 for $2000 and which has a useful life of four years. During the year gross income was $4000 and expenses were $1000. A quarter of the value of the truck was used up, so a depreciation of $500 would be allowed to arrive at a net income of $2500.

In commenting on depletion, he supposed a production of 1,000,000 cu. yd. of sand and gravel, which yielded a profit of $200,000, or 20 cents per cu. yd., after paying all expenses. However, the gravel in place cost 10 cents per cu. yd., which means that real profit actually was only $100,000.

It amazes Mr. Ash that some producers do not yet consider the price paid for their materials in computing profits and, that in the ready-mixed concrete industry, some do not include a part of the cost of the mixer truck in computing the cost of every truckload of concrete delivered.

Any deductions from gross income, he pointed out, however, including deductions for depreciation and depletion, are matters of legislative grace, meaning that Congress has the power, if it sees fit, to tax gross income and not allow any deductions. However, since the advent of the income tax, he said that Congress has always allowed deduction of the customary costs considered in computing actual net income.

The present law provides for an allowance for depreciation and in addition a reasonable allowance for the exhaustion, wear and tear (including a reasonable allowance for obsolescence) of (1) property used in trade

or business or (2) property held for the production of income.

As to the capital sum recoverable through the depreciation allowance, Treasury regulations state the sum "is the cost or other basis" which means the adjusted basis for determining gain from a sale. To illustrate, Mr. Ash supposed that on January 1 of some year a machine with estimated life of eight years was purchased for $12,000. The deduction would be $1500 each year. If, after use of the machine for two years, it developed that the machine would last 10 years longer, the remaining "basis" would be $12,000 less $3000 already deducted divided by 10 or a deduction rate of $900 annually.

Depreciation allowance is calculable, according to the Treasury Department, in accordance with any recognized trade practice. Most common is the straight line method whereby the cost or other basis of the property, less its estimated salvage value, is deducted in equal annual amounts over the estimated useful life of the asset.

A second method is the unit-of-production method whereby the number of units used is compared with total units that may be produced by a machine or other property. A third method is the declining balance or diminishing balance method whereby the greatest amount of depreciation is taken in the first year of use, with continually decreasing amounts of depreciation in later years. In this method with a depreciation rate of 10 per cent, the second year the allowance would be 10 per cent of the remaining unrecovered cost after the first year's deduction, and so on, which would require much more than 10 years to recover the total cost. The Treasury Department, according to Mr. Ash, has indicated that it would permit members of the two industries to use the declining balance method with the rate 150 per cent of the straight line rate. He cautioned that the method of computing depreciation cannot, in any case, be changed without first obtaining permission from the Commissioner of Internal Revenue.

In these days of technological changes, Mr. Ash pointed out, the allowance for obsolescence may be important. As an example he supposed a machine was purchased for $5500, with an estimated useful life of ten years and a salvage value of $500. If, at the end of five years when the depreciated value is $2500, a new invention comes along that renders the machine economically useless at the end of two more years, the remaining cost of $2500 may be deducted at the rate of $1250 a year.

Mr. Ash believes there is a possibility when we have the next general revision of the tax law that accelerated depreciation will be allowed on new plants and machinery. One plan provides that owners of new plants be permitted to depreciate one-half of the cost over the first quarter of the useful life. The Chamber of Commerce has proposed that, at the election of the taxpayer, 25 per cent of the cost may be written off in the year of acquisition, or over a period of not more than five years.

Left to right: John D. Gregg, Whittier, Calif.; J. Rutledge Hill, Dallas, Texas; and Bob Mitchell, Los Angeles, Calif.

In discussing depletion, Mr. Ash again pointed out that any deduction is not made as a matter of right but depends entirely upon legislative grace. The allowance is made to the person owning an economic interest in the property. He outlined how the computation of cost depletion is calculated. One thing pointed out was that where land is purchased to secure the sand and gravel which lies under it, the purchaser must deduct the residual value of the land to determine the cost of the sand and gravel. The cost or basis is divided by the estimated recoverable units to arrive at a "depletion unit."

Percentage depletion whereby a specified percentage of the gross income from the property may be deducted, not to exceed 50 per cent of the net income of the property, was discussed. This provision for percentage depletion, a subject of great interest to the rock products industry, is now applicable to operators of oil and gas wells at the rate of 27½ per cent and to a number of other commodities at lower figures. Thus far efforts to secure percentage depletion for the sand and gravel industry have met with little success because the House Ways and Means Committee considers these products as commonplace.

Mr. Ash believes there is a reasonable possibility that the three per cent tax on the transportation of property for hire may be repealed when Congress revises the Internal Revenue Code.

The Treasury in writing its regulations, according to Mr. Ash, has ignored Congressional intent in denying relief to industry under Section 735 of the Internal Revenue Code. This Section, enacted by Congress, would grant relief to producers of natural resources who during the war produced in excess of normal production. It would exempt from excess profits taxes the income due to this excess production. In order to win, the Tax Court must hold the Treasury Regulations are invalid and, he said, a decision will be handed down soon on a suit tried by Mr. Ash last Fall.

Taft-Hartley Act

JAMES D. MARSHALL, assistant managing director, The Associated General Contractors of America, Inc., outlined the significance of the Taft-Hartley Act to the construction industry. He said that encouragement to organized labor since 1932 had resulted in practically closed shop conditions in much of industry and that it will be difficult to secure cooperation to the spirit of the Act even where workers desire to comply, because of the past history of worker relations.

The Wagner Act, he said, did not apply to the construction industry but closed shop conditions existed on a local area basis and many of those agreements are expiring now. So, the construction industry is on the verge of applying the new Act. Mr. Marshall said he was almost certain that some construction jobs will be regulated by the Act and that the industry will assume that every case does come under its provisions until there is proof to the contrary. That practice will standardize procedure. One of the complications in the construction industry is that various kinds of employes are engaged as a job progresses, with many changes, which makes it difficult to apply a law that was designed for plant workers.

Secondary boycotts and jurisdictional disputes constitute one of the major problems. Many agreements in the construction industry are in the nature of codes of ethics, he said, in stating that some unions will be slow in entering "no strike" agreements.

Freight Rates — Car Requirements

SOME interesting statistics covering the freight car situation were given in a talk by W. E. CALLAHAN, manager, open car section, car service division, Association of American Railroads. In 1947, he said, some 44,500,000 cars were loaded for revenue. The ton-miles were close to 650 billion for 1947 and broke all peace time records. Miles per car per day also broke records with a 46 miles per day per car for 1947. Turn-around time for last year was 13.8 days with the month of October having a turn-around time of 12.4 days or an all-time record. Tonnage per car for sand and gravel was about 58 tons and exceeded the previous year slightly. The speaker also gave considerable statistical data on the number of cars in service, the number of retirements, and the number of new cars built. While no great gain in total ownership was recorded, he did point out that the hoppers increased 10,004 units and that orders for new gondolas and hoppers as of December 1, 1947 was another all-time high, 59,900 gondolas and hoppers. The present car building program calls for an objective of 10,000 units per month.

He pointed to the fact that many of the new cars under construction were of larger capacity so that of 109 cars retired, 100 new cars would replace their net tonnage. This related to the open top cars only. New covered hopper cars were all 70-ton capacity, and 26 per cent of the new gondolas carried 70-ton loads. This 70-ton figure, he said, is possibly the maximum that present rails, bearings, etc., will stand.

The speaker also quoted from several sources relating to the probable business for the coming year stating that new construction would rise above the past year and that gravel, sand and stone carloadings would exceed 1947 by 5 per cent with cement exceeding by 11.7 per cent. On the general over-all picture for car supply, he said that during the last half of 1948 the car situation will be somewhat better than last year assuming that business trends were as above indicated.

Freight Rates

VINCENT P. AHEARN, executive secretary, National Sand and Gravel Association, addressed the meeting on the subject, "Action Taken by State Commissioners on Intrastate Rates Following Increases in Interstate Rates." In this paper, Mr. Ahearn reviewed the rate structure on sand and gravel beginning with the decision Ex Parte 123 when the Commission authorized an increase in rates of 10 per cent, effective March, 1938. In 1942 an increase of 3 per cent was authorized (Ex Parte 148) but this increase was later canceled. In July, 1946 this 3 per cent was restored along with an additional 5 per cent increase for Eastern lines. Late in 1946 the carriers were authorized in Ex Parte 162 to increase interstate rates 15¢ per ton. Again in 1947 the carriers in Ex Parte 166 asked for an increase in rates along with several amendments until the carriers are now asking for an increase of 41 per cent in Eastern territory, 31 per cent in Southern and Western. All percentage increases are subject to a proposed maximum of 33¢ per ton. The final decision on this later proposed increase has not been reached but interim increases of 10 per cent in October, 1947 and an additional increase of another 10 per cent in December of the same year were granted. Mr. Ahearn included a typed statement available to those present on the actions by state commissions.

Mr. Ahearn points out in his paper that sand and gravel is a short-haul, heavy-load commodity and the lowest valued commodity hauled by the railroads. The freight paid exceeds the value of the product, he said. He cautioned that increases in freight rates might upset present notions as to how and where to build a plant and the industry may face the possibility of taking over the portable plant and thereby remove forever the revenue now earned by the railroads from sand and gravel haulage.

Federal Labor Policy

The Taft-Hartley Act was largely emphasized in a talk, "New Developments in the Federal Labor Policy," before a joint session of the two industries by CHARLES A. HORSKY, counsel for the two Associations. The actual working of the new Act must yet undergo trial, as he pointed out, in outlining its principal features and objectives.

The Act, he said, is a warning that the public interest must and will be protected and represents the last step in preservation of the collective bargaining system for settlement of labor disputes, short of government regulation. He emphasized that it is to the interest of both labor and management that the Act prove workable. He traced the steps in legislation that led to enactment of an Act that finally considers the problems of employers on a fair basis with labor. The outbreak of strikes following the war, which were so detrimental to the public, were the real cause for the enactment of an Act which still favors the freedom of collective bargaining.

Mr. Horsky mentioned some of the principal features such as the injunctions that may be brought against unions by the attorney general if strikes result in national emergencies, the outlawing of jurisdictional strikes and provisions for decertification of unions. He believes the policies as set forth in the Act are sound. While there have been fewer strikes since the law was enacted, the fact that this is an election year and the season itself were mentioned as factors that might have an effect in judging yet whether the Act is effective in minimizing strikes.

New Wallboard Plant

(Continued from page 89)

Smidth tube mill. The tube-milled stucco is then elevated to the two ground stucco bins. Both of these bins are provided with duplex Ehrsam mixers and 4-tube Bates packers. The design of the plant in this section is such that the fine stucco from the refuse screens can by-pass the tube mills and go direct to any or all three of these main stucco bins if desired.

The stucco after passing the refuse screen can go to the wallboard plant.

The fine white stucco can go to the gauging or moulding bin under which are single Ehrsam mixers and a 3-tube packer. A second gauging plaster bin is provided for storage purposes only, and it has facilities for returning the gauging plaster to the first mentioned gauging bin for packing. In this section there are four steel bins and six mixers and four packers, all so designed that there is a maximum demum degree of flexibility.

The steam plant used for heating the various buildings and for the Coe dryer has one 50,000 lb. per hour Combustion Engineering Co. boiler and a second 100-hp. E. Keeler Co. boiler. Oil storage at the dock is provided for 650,000 gal. of fuel oil. In the steam plant are two Cochrane return pumps, one Gould make-up pump and a Gardner-Denver steam pump for return water to the boiler. The steam plant is provided with Bailey automatic instrument controls. Soot blowers are also provided.

The new plant is provided with a wide variety of dust collectors other than those already named for in the entire assembly can be found Sturtevant and Sly dust collectors, each placed in the circuit so as to get the best result. The plant is possibly one of the most dustless in the gypsum industry.

Deliveries can be made from the plant over the rails of the Canton railroad or by trucks.

Officers of the National Gypsum Co. are: Melvin H. Baker, president; L. R. Sanderson, vice-president in charge of operations; D. E. Crandell, vice-president in charge of sales; J. C. Best, vice-president in charge of industrial sales; F. A. Manske, general production manager; E. B. Hollingsworth, assistant production manager; and C. E. Anderson, plant manager at Baltimore.

Main offices of the company are in Buffalo, N. Y. The regional sales offices for the National Gypsum Co. for the Baltimore area will be in the offices at the plant.

Convention Draws Record Attendance

National Crushed Stone Association and Agricultural Limestone Division convention programs of keen interest to operating men

ALL RECORDS for attendance fell at the thirty-first annual convention of the National Crushed Stone Association, held January 26-28, at Cincinnati, Ohio. Held in connection with the third annual convention of the Agricultural Limestone Division, January 29 and 30, the combined attendance, including equipment manufacturers' representatives, was approximately 1000. These meetings followed by a week those of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, marking the first time since 1942 that a machinery exposition was held concurrent with these conventions. The practice is to be continued on an alternate year basis and the next exposition will likely be at the Stevens hotel, Chicago, in 1950. The 1949 meeting, without exhibits, will be February 7-9 at the New Yorker hotel, New York, N. Y. Operating men and equipment manufacturers had two entire sessions devoted to discussion of production problems. One was specifically for discussion of topics presented in advance; the second was set aside entirely for a panel discussion of split-second delayed action blasting.

Other sessions considered reports of the Washington staff, a presentation of the outlook for business in 1948 by president G. A. Austin, the relation of aggregates to the durability of concrete, the federal highway program, safety, railroad transportation, macadam roads, the Taft-Hartley Act, Wage-Hour Law and the Portal-to-Portal Act of 1947. Social events included a cocktail party and buffet supper and the annual banquet.

Presiding Officers

G. A. AUSTIN, president, was presiding officer of the opening general session and RUSSELL RAREY was chairman at the Greeting Luncheon on the opening day. T. C. COOKE and NELSON SEVERINGHAUS, as usual, were presiding officers and discussion leaders for the sessions set aside for operating men. Other session chairmen were President-elect W. S. WESTON, JR.; W. H. WALLACE; and J. B. TERBELL, for a general luncheon; and F. J. BUFFINGTON for an informal evening session on the subject of safety.

Ladies' Entertainment

Ladies' entertainment included a get-together tea, sight-seeing tour, luncheon, and ice show, and all the social functions scheduled for the convention.

Resolutions

Resolutions were read to the convention expressing appropriate tribute in the deaths of W. S. Weston, Sr., president of The Weston and Brooker Co., Columbia, S. C., and W. M. Andrews, Union Limestone Co., Youngstown, Ohio.

The Board of Directors voted unanimously to continue indefinitely payment of a regular salary to Miss Beulah Davies, secretary to Mr. Goldbeck, during her illness. Miss Davies has served the Association for 21 years.

Safety Awards

F. J. BUFFINGTON, chairman of the cement and quarry section, National Safety Council, and safety engineer of the New York Trap Rock Co., presented the National Crushed Stone Association safety awards. The bronze plaque presented by *Explosives Magazine* for the best record went to the LeRoy quarry of General Crushed Stone Co. Eleven quarries had perfect safety records, but had not worked as many man-hours.

These quarries are: Ohio dolomite quarry, The J. E. Baker Co., Millersville, Ohio; Inwood limestone quarry, The J. E. Baker Co., Inwood, W. Va.; Bakerton limestone mine, The Standard Lime and Stone Co., Bakerton, W. Va.; Blue Mount Trap-rock quarry, The J. E. Baker Co., Blue Mount, Md.; Marquette limestone quarry, Marquette Cement Mfg. Co., Cape Girardeau, Mo.; Winchester trap-rock quarry, The General Crushed Stone Co., Winchester, Mass.; Union Furnace limestone quarry, Warner Co., Tyrone, Penn.; Plaineville No. 4 trap-rock quarry, The New Haven Trap Rock Co., Plainville, Conn.; Middlefield No. 1 trap-rock quarry, The New Haven Trap Rock Co., Middlefield, Conn.; No. 4 trap-rock quarry, Southwest Stone Co., Knippa, Tex.; and Millerdale limestone quarry, Waterloo Dredging Co., Waterloo, Iowa.

W. S. Weston, Jr., new president, N.C.S.A., left, shaking hands with retiring president, G. A. Austin

Let's Size Up the Situation

GUEST SPEAKER at the Greeting Luncheon of the National Crushed Stone Association, James G. Stewart, Justice, Supreme Court of the State of Ohio and former Mayor of Cincinnati, titled his talk, "Let Us Size Up the Situation." In looking at the United States and its position in the world today, Mr. Stewart warned that the American way of life is in just as great or perhaps greater danger from within than from without.

Drawing a parallel between the present day and its problems and the day and problems confronting the founding fathers, Mr. Stewart pointed out that our Constitution recognized the fault of allowing too much power to be concentrated in too few hands—but that the danger was more than ever present today.

New Officers

W. F. WISE presented the nominations for directors and officers for election. A unanimous vote was cast for the following: For president, W. S. Weston, Jr., Weston & Brooker Co., Columbia, S. C.; Regional vice-presidents, T. C. Cooke, Lynn Sand and Stone Co., Swampscott, Mass. (New England); E. Eikel, Servtex Materials Co., New Braunfels, Texas (Southwestern); V. C. Morgan, Kentucky Stone Co., Louisville, Ky. (Central); W. T. Ragland, Superior Stone Co., Raleigh, N. C. (Southwestern); F. W. Schmidt, Jr., North Jersey Quarry Co., Morristown, N. J. (Eastern); W. H. Wallace, Wallace Stone Co., Bay Port, Mich. (Northern); W. N. Carter, National Stone Co., Joliet, Ill.

(Midwestern); and Mrs. Anna R. Wilson, Granite Rock Co., Watsonville, Calif. (Western); Directors, G. A. Austin, Consolidated Quarries Corp., Decatur, Ga.; L. J. Boxley, Blue Ridge Stone Corp., Roanoke, Va.; H. H. Brandon, Melvin Stone Co., Melvin, Ohio; J. Reid Callanan, Callanan Road Improvement Co., South Bethlehem, N. Y.; Bruce S. Campbell, H. T. Campbell Sons' Corp., Towson, Md.; A. J. Cayia, Inland Lime and Stone Co., Manistique, Mich.; H. N. Clark, Dolomite Products Co., Inc., Rochester, N. Y.; F. O. Earnshaw, Carbon Limestone Co., Youngstown, Ohio; Arthur F. Eggleston, John S. Lane & Son, Inc., Meriden, Conn.; W. P. Foss, III, New York Trap Rock Co., New York, N. Y.; Otho M. Graves, General Crushed Stone Co., Easton, Penn.; G. F. Hammerschmidt, Elmhurst-Chicago Stone Co., Elmhurst, Ill.; R. G. L. Harstone, Canada Crushed Stone, Ltd., Hamilton, Ont., Canada; J. L. Heimlich, LeRoy Lime and Crushed Stone Corp., LeRoy, N. Y.; R. P. Immel, American Limestone Co., Knoxville, Tenn.; N. E. Kelb, Cumberland Quarries, Inc., Indianapolis, Ind.; H. C. Krause, Columbia Quarry Co., St. Louis, Mo.; R. T. Lassiter, Southern Aggregates Corp., Raleigh, S. C.; J. C. Lauber, Trap Rock Co., Minneapolis, Minn.; George Lott, Jr., Palmetto Quarries Co., Columbia, S. C.; M. E. McLean, East St. Louis Stone Co., East St. Louis, Ill.; Paul M. Nauman, Dubuque Stone Products Co., Dubuque, Iowa; H. E. Rainer, Federal Crushed Stone Corp., Buffalo, N. Y.; Russell Rarey, Marble Cliff Quarries Co., Columbus, Ohio; J. A. Rigg, Acme Limestone Co., Fort Spring, W. Va.; A. Battle Rodes, Franklin Limestone Co., Inc., Nashville, Tenn.; W. R. Sanborn, Lehigh Stone Co., Kankakee, Ill.; James Savage, Buffalo Crushed Stone Corp., Buffalo, N. Y.; A. T. Smith, Rock Hill Quarries Co., St. Louis, Mo.; O. M. Stull, Liberty Limestone Corp., Buchanan, Va.; D. L. Williams, Virginian Limestone Corp., Ripplemead, Va.; W. F. Wise, Southwest Stone Co., Dallas, Texas; and A. L. Worthen, New Haven Trap Rock Co., New Haven, Conn. In addition to the foregoing elected directors, the president and regional vice-presidents also are members of the board of directors.

Honorary members of the board are John C. Gall, Washington, D. C.; John Rice, General Crushed Stone Co., Easton, Penn.; H. E. Rodes, Franklin Limestone Co., Nashville, Tenn.; Stirling Tomkins, New York Trap Rock Corp., New York, N. Y.; and Harold Williams, Boston, Mass.

The Agricultural Limestone Division will be represented by H. C. Krause, Columbia Quarry Co., St. Louis, Mo.; P. E. Heim, Carbon Limestone Co., Youngstown, Ohio; and S. P. Moore, Concrete Materials and Construction Co., Cedar Rapids, Iowa.

Russell Rarey, Marblecliff Quarries Co., presiding at Monday luncheon, with Otto Graves seated to the right

BUSINESS CONDITIONS

PRESIDENT G. A. Austin, in calling the first session of the National Crushed Stone Association convention to order, reported that the Association was functioning successfully, and encouraged maximum participation in free discussion throughout the convention meetings. He was pleased that the annual convention had drawn the largest attendance on record and that the manufacturers had not only prepared a very excellent exhibit but had on hand many experts to participate in the sessions planned for operating men. Otho Graves, convention chairman, was congratulated for having planned an excellent over-all program.

Business Conditions

Mr. Austin then summarized reports by the regional vice-presidents on business conditions during 1947 and the outlook for 1948. He pointed out that forecasts were very likely on the conservative side and tempered by the fact that 1948 is an election year. Volume of business in one section of the country in 1947 was double the volume of the previous year but, nationally, the increase in volume ranged from 10 to 25 per cent with an average of 16 to 18 per cent increase. The price level increased in the range of 8 to 22 per cent over 1946 with an average of 10 per cent.

Ratio of volume of demand to capacity was reported as 70 to 80 per cent by the majority, with some companies reporting 100 per cent. The railroad car shortages during 1947 were, of course, a serious consideration. Distribution of business in major categories was reported as follows: highways, 30 to 65 per cent range, with an average of 50 per cent; building, a range of 5 to 50 per cent, with an average of 20 per cent; railroads, a range of 6 to 20 per cent, with an average of 50 per cent. The range in volume for chemical and metallurgical stone was 2 to 23 per cent, for riprap, 1-8 per cent, and for miscellaneous uses including concrete products, as much as 8 per cent.

No pronounced changes in the proportionment of business are anticipated in 1948 but a slight increase in highway volume is expected in some sections. It was almost unanimous that there would be a slight increase in total volume of business in 1948 although estimates were conservative because of the many unpredictable and disturbing elements that will enter the business picture. One exception was a prediction of 15 per cent decreased volume in 1948.

A great deal of new productive capacity was added, or in process of addition, in 1947, which will materially increase the industry's over-all capacity, according to reports received by Mr. Austin. Great concern had been reported on the effects of increased railroad freight rates and it was unanimously predicted that railroad loadings would decrease and that a greater percentage of the tonnage would be diverted to roadside stone and gravel pits served by truck haul. It was also unanimous opinion that high costs of building, of labor and materials, will curtail the building of many miles of highways. To emphasize the seriousness of conditions, Mr. Austin quoted, in part, from a letter he had received from the Chief Highway Engineer in Georgia, which read "We are already changing our plans to employ more local materials on account of car shortages and because of threatened freight rate increases. Also, new types of pavements are being developed."

General comments that he received were briefly touched upon. Some producers reported that business was spotty, others said they were having their largest volume of business in history, while 1948 profits were ex-

pected to be reduced for some companies because of increasing cost of operations. Canada was reported to be anticipating a banner year. Mr. Austin concluded with the prediction that the industry will surmount its problems and have a good year in 1948.

Administrative Director's Report

Administrative Director J. R. BOYD confined his report largely to discussion and description of the new headquarters in Washington. The new facilities were illustrated by slides. A tremendous task was involved in moving to the new building purchased by the Association, which consumed a good part of the working time of the Association staff in 1947, but the facilities are excellent and will be the means of providing administrative and research services far beyond anything that could be available before. Membership increased by five active members in 1947 and five associate.

Engineering Director's Report

Moving of the engineering laboratory facilities to the new headquarters occupied a good part of the attention of the engineering staff during 1947, however, Engineering Director A. T. GOLDBECK reported a number of active researches underway. Progress continued in the laboratory in connection with the cooperative work on concrete tests with the State of Connecticut, P.R.A. and the National Sand and Gravel Association, involving tests of concrete made from trap rock and gravel with air-entraining cement. The tests were intended to control the trend of future specifications.

Another series of tests has revealed that the durability of limestone sand concrete is vastly improved by air entrainment and, as a result, it is believed that other fine aggregates hitherto unsuitable may be acceptable for pavements where air-entrained concrete is used.

Other laboratory studies have had to do with mineral fillers for use in bituminous concrete, to determine if "bulk" or "apparent" specific gravity should be used in connection with bi-

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W. S. Weston, Jr., newly elected president, and J. R. Boyd, administrative director at the board of directors meeting

EXHIBIT VIEWS

(1) **American Cyanimid Co., New York City.** Mounted on the backdrop of this booth was a large transparency of the company trade-mark; and prominently displayed on a table were copies of the company booklet: Products and Services of American Cyanimid Co. for Industry and Agriculture.

(2) **Deister Machine Co., Ft. Wayne, Ind.** Chief attraction at this booth was a 3- x 8-ft. single-deck, 2-bearing V-belt drive Plat-o vibrating screen. **A. Leschen & Sons Rope Co., St. Louis, Mo.** A full-size, illumined, revolving model of a cable drum attracted attention. Samples of wire rope varying from ⅜- to 2-in. in thickness were on display as well as samples of cable slings.

(3) **Vibration Measurement Engineers, Chicago, Ill.** Two Leet Seismographs were the nucleus of this exhibit; flanked by a recording machine for measuring sound intensity. One Leet machine was operating, showing exhibit floor vibrations, the other had the case removed to show machine detail. Backdrop was formed by enlarged seismograph recordings showing waves of a proper and an improper blast.

(4) **E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.** A delayed action blasting machine, with a simulated quarry wall on the backdrop showing 15 hole quarry blast drilling having lights at each blast point to show time interval between blasts as delivered by the machine was featured. Samples of delayed action blasting caps and types of blasting powder were shown. **Talcott Belt Fasteners, Providence, R. I.** A simulated belt conveyor with a belt fastener in the middle provided reason for the cut-out trade-mark Belt Man Luke, with hammer, saying, "You can install a Talcott with a hammer." Samples of various types of belt fastenings were on display.

(5) **Cummins Engine Co., Inc., Columbus, Ind.** Chief attraction was a cut-away, activated, 6-cylinder engine of the NHBS-600 series. An easel panel carried examples of all important fuel pump parts.

(6) **The Frog, Switch & Manufacturing Co., Carlisle, Penn.** In addition to literature on the table of this booth were pencils and notebooks, bearing the company name. The backdrop featured company calendars.

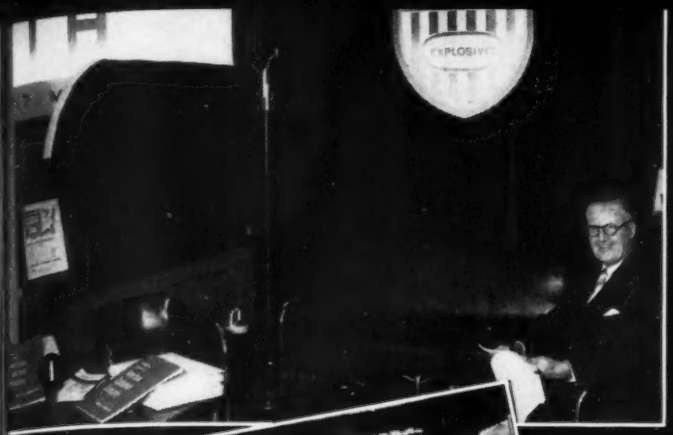
(7) **Robins Conveyors Division of Hewitt-Robins, Inc., Passaic, N. J.** Nearly filling the booth, a 4- x 12-ft. M-9 Vibrex (vibrating) 2-bearing floor mounted screen was center of this display. In addition, racks carrying seven different types of conveyor idler were shown. **Sauerman Bros., Inc., Chicago, Ill.** Backdrop in this booth was formed by an enlarged photo of a new drag-line installation, featuring remote control for the positioning of the head block. **The W. S. Tyler Co., Cleveland, Ohio.** An enlarged photograph of a 4- x 14-ft. F-800 Tyrock 3-deck vibrating screen was featured in this booth; plus a working scale model vibrating screen and actual Ro-tap testing sifter and portable field testing screen.

(8) **Harristeel Products Co., New York City.** Mounted on this booth's backdrop were 15 samples of various woven wire screens. Featured was the firm's Wabbly Weave, designed to prevent screen clogging. **Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich.** A completely glass-enclosed cut-away 3-cylinder Diesel engine, mounted on a turntable, formed the center of interest. Around the base of the glass enclosure were enlarged photographs showing actual installations of these engines.

(9) **Marion Power Shovel Co., Marion, Ohio.** A colored movie showing all "post-war" equipment of company manufacture in action was displayed. The all-welded design and air-control features of these machines were stressed. **Taylor-Wharton Iron & Steel Co., High Bridge, N. J.** This company emphasized that it was the first producer of iron, steel and alloy steel in the United States. The backdrop carried examples and photographs of alloy steel equipment parts. **Pioneer Engineering Works, Inc., Minneapolis, Minn.** Centerpiece of this booth was a stand surmounted by a large revolving wheel with continuous panoramic views, in color, of three complete Pioneer-equipped plants.

(10) **Ludlow-Saylor Wire Co., St. Louis, Mo.** A large 3-panel screen, mounted with 250 samples of wire cloth from the finest mesh up to 5-in. opening, formed a backdrop and display at this booth.

(11) **Traylor Engineering & Manufacturing Co., Allentown, Penn.** Five enlarged photographs of company equipment installed in cement plants, quarries, etc., some in points as far distant as the Philippines, were displayed. **Jeffrey Manufacturing Co., Columbus, Ohio.** A series of four 2-A 5¼- x 30-in. open pan feeders, arranged around four sides of a square and each feeding to the next in an endless chain created interest. A brightly vari-colored granular material was the feed, showing operation of vibratory feeder principle. Large photographs of typical hammermill and feeder installations plus parts and samples of other items of manufacture completed the display. **Diamond Iron Works, Inc., Minneapolis, Minn.** Two large photographs of company portable crushing plants fitted to tandem-axle tractors "on the road," painted orange, attracted attention.



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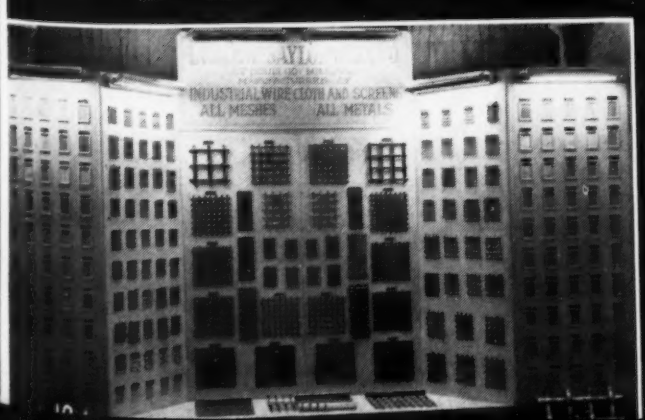

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Exterior view of headquarters building modernized for laboratory and office facilities

tuminous concrete calculations, development of a stockpileable bituminous mix involving the use of anti-stripping agents.

Work is continuing to determine if stone sand particles require reshaping and how it might be accomplished and tests on samples of ledge rock from a number of ledges in a quarry to determine its uniformity and suitability for various classes of uses. In addition, special tests have been made of sand to determine their suitability for concrete, for determining concrete proportions for given aggregates and for a number of other purposes.

Mr. Goldbeck briefly touched upon his field trips, activities in technical societies, the writing of technical papers and detailed some of the problems involved in moving and setting up the laboratory equipment in the new laboratory.

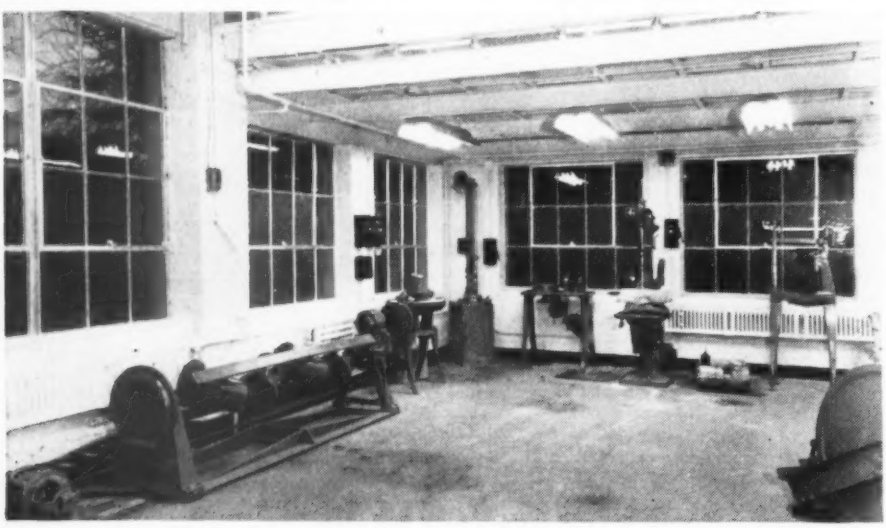
Field Engineer's Report

Field engineer J. E. GRAY had a very active year in traveling on special assignments involving specific technical problems; in attendance at meetings of local crushed stone associations, state highway conferences and engineering societies; and in calling on member companies to render technical assistance. Some of the special assignments have involved the writing of specifications, complaints on the use of crushed stone and cooperative research investigations. Requests for assistance on the part of members have taken precedence over all other work. As a result of these travels many problems have been brought to light which require the use of the laboratory facilities in their solution.

Among the researches undertaken as a result of these contacts, and many important ones were enumerated, were several of special significance. One was directed toward the optimum blend of screenings and natural sand because, apparently, freight rates for natural sand have stimulated interest in local sources of manufactured sand. Heretofore, stone sand manufacture was limited to localized areas where there was a dearth of good natural sand.

The suitability of a particular stone for the manufacture of filler for asphaltic concrete; relative designs of slag and stone bituminous concrete with regard to cost; effects of variations in quality of stone in a given quarry; relative fouling of crushed stone and gravel ballast; the relative merits of uncrushed gravel and crushed stone in bituminous concrete; the relative merits of traffic bound crushed stone base and soil-cement stabilization are among the problems involving research that have come to Mr. Gray's attention.

Mr. Gray has made a number of trips with sales representatives of member companies to assist by correlating engineering with sales and has called on a number of prospective members.



Corner of laboratory showing rock testing equipment, including Deval abrasion machine, Dorry hardness machine, Page impact machine, grinding lap and diamond saw, diamond core drill, and molding press for cementation specimens

Later Than You Think

This session concluded with an inspiring sales presentative, "It May Be Later Than You Think," by Frank W. Lovejoy, president of the Sales Executive Club, New York, N. Y. One important but unfortunate point brought out was that it usually takes a recession or some other drastic event to wake industry up to the fact that it must market its goods, when business is good, to stimulate business in the future. To express it differently, he emphasized that when the need for selling is at hand it is too late.

Manufacturers' Division Business Meeting and Luncheon

AN EXCELLENT ATTENDANCE greeted Chairman J. B. Terbell, Manufacturers' Division, at the annual business meeting and luncheon on Tuesday, January 27. The chairman called for reports from the various committees. R. C. Johnson presented the report of the Resolutions Committee which expressed the thanks of the Division to President G. A. Austin of the National Crushed Stone Association; J. R. Boyd, secretary; L. W. Shugg, exhibits director; and J. B. Terbell, chairman. The resolutions also expressed the sympathy and loss to the Division in the death of A. J. Blair, W. S. Weston, Wm. Andrews, prominent stone producers, and manufacturer members, A. M. Eiben, Bruce Shotton, and Phil Tennant.

Manufacturers' Division

The Manufacturers' Division of the National Crushed Stone Association named the following officers and directors: Chairman, Cott Farrell, Easton Car & Construction Co., Easton, Penn.; Secretary, J. R. Boyd, Washington, D. C.; Vice-Chairmen, R. C. Johnson, Simplicity Engineering Co., Durand, Mich.; J. Craig McLanahan, McLanahan Stone Corp., Hollidaysburg, Penn.; L. C. Mosley, Marion Power Shovel Co., Marion, Ohio; C. H. Roberts, Traylor Engineering & Manufacturing Co., Allentown, Penn.; J. A. Trainor, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; and Irwin F. Deister, Deister Machine Co., Fort Wayne, Ind.; Directors, E. C.

Anderson, Kensington Steel Co., Chicago, Ill.; D. McM. Blackburn, Hendrick Mfg. Co., Carbondale, Penn.; A. E. Conover, Robins Conveyors Division, Hewitt-Robins, Inc., Passaic, N. J.; L. A. Eiben, Northern Blower Co., Cleveland, Ohio; S. S. Ellsworth, Ensign-Bickford Co., Simsbury, Conn.; R. F. Feind, Allis-Chalmers Mfg. Co., Milwaukee, Wis.; C. O. Friend, Nordberg Mfg. Co., Milwaukee, Wis.; J. Harper Fulkerson, Cross Engineering Co., Carbondale, Penn.; E. J. Goes, Koehring Co., Milwaukee, Wis.; E. M. Heuston, Bucyrus-Erie Co., South Milwaukee, Wis.; C. S. Huntington, Link-Belt Co., Chicago, Ill.; John M. Jeffries, Atlas Powder Co., Wilmington, Del.; W. W. King, W. S. Tyler Co., Baltimore, Md.; Kenneth Lindsay, Iowa Mfg. Co., Cedar Rapids, Iowa; B. R. Maloney, E. I. du Pont de Nemours & Co., New York, N. Y.; R. M. Murdock, Frog, Switch & Mfg. Co., New York, N. Y.; Milo A. Nice, Hercules Powder Co., Wilmington, Del.; F. O. Reedy, Kennedy-Van Saun Mfg. & Eng. Corp., New York, N. Y.; W. A. Rundquist, Pioneer Engineering Works, Inc., Minneapolis, Minn.; J. B. Terbell, American Manganese Steel Division, The American Brake Shoe Co., New York, N. Y.; F. B. Ungar, Ludlow-Saylor Wire Co., St. Louis, Mo.; R. E. Wiley, American Cyanamid Co., New York, N. Y.; Roy Wills, Lima Shovel and Crane Division, Lima-Hamilton Corp., Lima, Ohio; and W. A. Wirene, General Electric Co., Schenectady, N. Y.

The Manufacturers' Division will be represented by: Cott Farrell, Easton Car & Construction Co., Easton, Penn.; R. C. Johnson, Simplicity Engineering Co., Durand, Mich.; and J. B. Terbell, American Manganese Steel Division, American Brake Shoe Co., New York, N. Y.

It was voted to recommend that the next exhibit be held at the Stevens Hotel, Chicago, in 1950.

General Luncheon-Crisis in Railroad Transportation

J. B. TERBELL, chairman, Manufacturers' Division, presided at the general luncheon, Wednesday, January 28. The guest speaker on this occasion was R. V. FLETCHER, special counsel, Association of American Railroads, who spoke on the subject, "The Crisis in Railroad Transportation." Mr. Fletcher briefly reviewed the recurring periods of crisis through which the railroads had passed.

He said that there are some justified complaints about railroad service, but in 1947 more carloads were hauled than in any year since 1930; even the war years were surpassed. On the question of car supply, Mr. Fletcher said that 68,507 new freight cars were added in 1947, 24,000 of which were open top, and of those now on order, 58,000 are open top. In 1946, the railroads moved 670,865 carloads of crushed stone or 2000 cars a day.

Interior view of new headquarters building of the National Crushed Stone Association showing excellent lighting of office area

Drill Experience — Operating Session

AT THE Operating Session, J. R. THOENEN, chief of the Tuscaloosa division, United States Bureau of Mines, University, Ala., presented his thesis on "Churn Drill Exploration." Those attending the session were given an advance copy of the report of investigations by the U. S. Bureau of Mines, published as R.I. 4058, and called "Churn Drill Performance." It was authored by the speaker and E. J. Lintner. Mr. Thoenen read brief extracts from this bulletin giving the hearers a summary, more or less, of their findings that covered a period of several years. His summary included the following:

(a) Drill performance decreased with elapsed time although there were some exceptions.

(b) There were decided differences in performance when using steel and manila rope cables. In one test, steel cables gave nearly 50 per cent more hole.

(c) The specific gravity of the drill sludge should be about 70 per cent of the sp. gr. of the rock being drilled.

(d) Lengthening the stroke seemed to increase performance with limitations.

(e) Performance, with limits, increased with tool weight.

(f) Number of strokes per minute had a minor effect.

(g) The volume drilled and the efficiency increased with bit diameter up to an optimum point. Linear hole drilled varied inversely with bit diameter.

(h) Sharpness of the bit had only a minor effect.

(i) Mechanical efficiency of a churn drill possibly in the 10 to 20 per cent range.

The speaker pointed out that the churn drill was essentially a crusher and depended for its performance upon the foot-pounds of energy im-

Looking toward northeast corner. Rock testing equipment may be seen, testing track in foreground

J. L. Heimlich, Leroy Lime and Crushed Stone Corporation, Leroy, N. Y.

parted to the cutting edge. He compared it with the gold stamp mill so common in the West to get the efficiency figures referred to under his summary. He said that numerous examples were available showing stamp mill efficiency when using rocks similar to those at Lithonia, Ga. From seven such examples, they arrived at a theoretical figure of 1500 foot-pounds of energy per cubic inch of rock. Or, in other words, each cubic inch of rock cut was assumed to have consumed 1500 foot-pounds of energy.

Discussion on Drilling

In the discussion that followed, A. T. GOLDBECK took the lead and pointed out the differences between churn drill and stamp mill practice. In the former case, he said, the drill is falling on rock with firm lateral supports, whereas the stamp falls on loose particles that could more or less flow under the impact and that this was one of several possible differences that could account for the low efficiency obtained by the rock drill in their calculations. He thought the drill should be kept sharp because of the greater chipping action, pointing out that the weight of the bit times the height of fall gives the foot-pounds of energy. The measurement of impact was important. The pad of dust or mud in the hole had a de-accelerating effect that resulted in low performances. He mentioned the need for proper water-ways in the drill and that the size of such should be at least 10 per cent of the cross section of the drill diameter, and mentioned a case with an 8½ in. diameter drill weighing 2400 lbs. where there was a loss of 1200 lbs. from retarding effects. With enlarged water-ways to one quarter of the diameter of the bit, the 1200-lb. figure was reduced to 195-lb. He thought some inventor should come forth with a drill that would blow compressed air into the hole just before the bit fell and to be synchronized with the drill mechanism.

T. C. McPoyle, John T. Dyer Quarry Co., right, chatting with A. S. Holway

Mr. Thoenen replied that air applications as suggested would be in many cases difficult to apply as most holes were wet holes and here they recommended a pulp sp. gr. of 70 per cent. He also said the effect of water-ways in drill bits was important although in some tests they closed off all water-ways and got almost as good results as when water-ways were open. The discussions brought out the fact that it would be difficult to get comparative results in churn drill tests because of the changes in character of rock from foot to foot, and to other uncontrollable variables.

(Continued on page 112)

EXHIBIT VIEWS

(1) **Iowa Manufacturing Co., Cedar Rapids, Iowa.** Backdrop at this booth was formed with four large blue-print transparencies, featuring three portable and one stationary plant. A working scale model of a vibrating screen plus samples of idlers and screen cloth samples completed the display. **Kensington Steel Co., Chicago, Ill.** A working sand drag that featured removable sprocket teeth that can be changed without removing the chain highlighted the exhibit. On the backdrop and elsewhere in the booth were displayed manganese steel castings of heavy machine parts.

(2) **Atlas Powder Co., Wilmington, Del.** Two recessed panels in this booth's backdrop contained a demonstration, with lights for blasts, showing the principle of Rock Master delayed action blasting in either fast or slow breaking rock. The two outside panels contained turntables, each with three scenes, showing the difference between the ordinary blast and the delayed action system. Bottles containing the 34 ingredients of high explosive powder were displayed on a table. **Kennedy-Van Saun Manufacturing & Engineering Corp., New York City.** A large photograph of a 500 ton 60-in. ball-bearing gyratory crusher, plus chart of product size, horsepower, feed opening, capacity, and other pertinent data of four similar crushers in actual operation in an Eastern quarry was on display.

(3) **Easton Car & Construction Co., Easton, Penn.** On a table carrying literature was a scale model tractor and side-dump semi-trailer. Backdrop was formed by a large photograph showing use of trailer units in a quarry, from loading at the shovel to dumping at the primary crusher.

(4) **Hercules Powder Co., Inc., Wilmington, Del.** Main attraction in this booth was a Split Second Timer, connected to a circle of colored lights to show the principle of a delayed action blast. The backdrop carried four plaques emphasizing the timer, company technical service, quarry explosives, and delayed action blasting caps.

(5) **Sanderson-Cyclone Drill Co., Orrville, Ohio.** A 5-ft. working model of the company's latest churn drill attracted attention. Backdrop featured a large detailed drawing of the company's patented spudder arrangement, plus large photographs of machines in operation. A 6-in. Superloy bit completed the exhibit.

(6) **Universal Engineering Corp., Cedar Rapids, Iowa.** Featured in this booth was a sound movie in color of the Twin-Dual Master (portable) gravel processing plant, plus portable hammermill and quarry plants in a variety of combinations. The backdrop carried colored photographs of actual operations.

(7) **Allis-Chalmers Manufacturing Co., Milwaukee, Wis.** Two pieces of machinery featured in this booth were a 4- x 12-ft. double-deck Ripl-Flo (vibrating) screen, 2-bearing, floor mounted; and a type R gyratory crusher with an automatic reset attachment. An enlarged plastic model of the automatic reset device showed the workings of this tramp-iron passer. A hydro-pneumatic accumulator plus two small pumps completed the display.

(8) **The Euclid Road Machinery Co., Cleveland, Ohio.** Eight colored transparencies framed on the backdrop showed bottom, side and end dump-trucks and trailers in actual operation. Centered on the backdrop was a large trade-mark transparency.

(9) **Keystone Driller Co., Beaver Falls, Penn.** A large cut-away backdrop gave a three-dimensional view of a simulated quarry with a traction-mounted, model 51, blast hole churn drill in the foreground. Flanking the quarry scene were large photographs of cranes, shovels, draglines and churn-drills in actual operation.

(10) **The Northern Blower Co., Cleveland, Ohio.** A ¼-scale working model of a 3-section, 15-ft. automatic bag-type dust arrestor created considerable interest. Silica sand was used for demonstration purposes. The model was fitted with plexiglass windows to show the inner workings of the bag sections.

Iowa Manufacturing Co.
ORO
CRUSHERS
SHOVELS
ORO
CONVEYORS
ELEVATORS
1

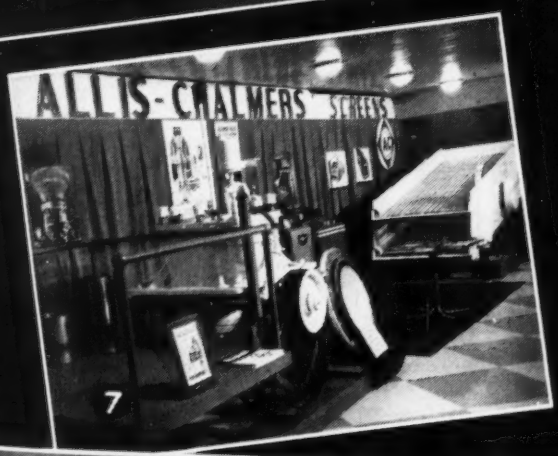
2

EASTON
Trailers
3

For Quarrying
4

244
SANDERSON-CYCLONE DRILL CO.
ORRVILLE, OHIO
5

Universal Crushers, Pulverizers, Complete Stone & Gravel Plants
CEDAR RAPIDS IOWA
6


ALLIS-CHALMERS
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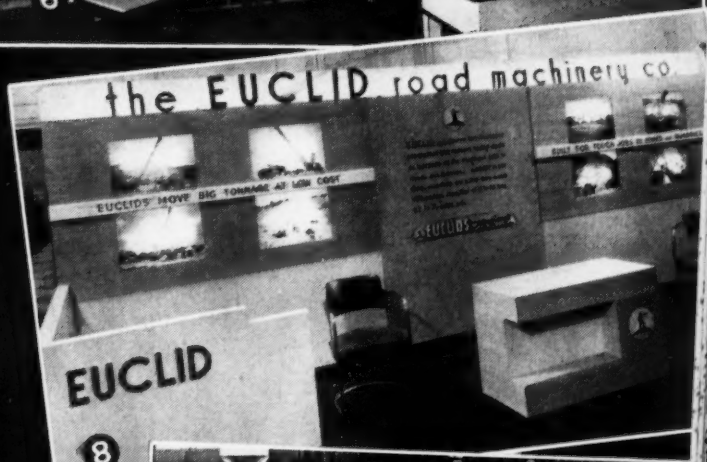
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EUCLIDS MOVE BIG TONNAGE AT LOW COST
EUCLID
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KEYSTONE DRILLER CO.
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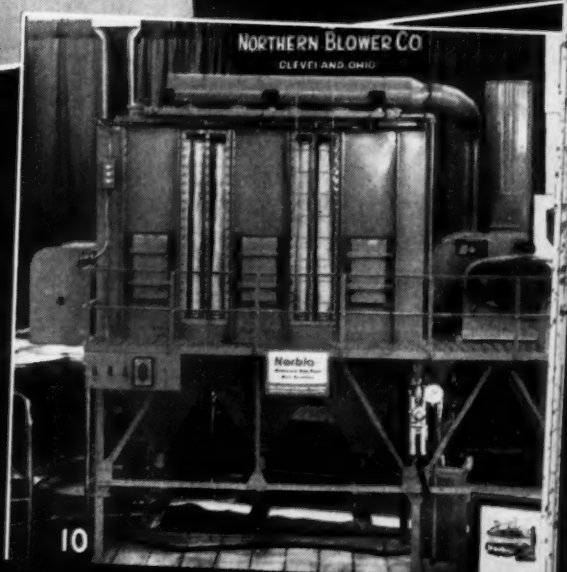

NORTHERN BLOWER CO
CLEVELAND, OHIO
10

Wilson P. Foss, III, recently elected president of New York Trap Rock Corporation

W. B. Paynter, Kentucky-Virginia Stone Co., Middlesboro, Ky.

M. Price, superintendent of Le Roy Quarry, General Crushed Stone Co., accepting Explosives Engineer Safety Trophy

WILSON P. FOSS, III, New York, N. Y., asked the speaker if screen analysis of the sludges on the first half hour of drilling were compared to the screen analysis on last half hour where drilling had been in progress for 2 to 3 hours. He wanted to know if the test would show larger or smaller cuttings. The answer was that no screen tests were made but the sp. gr. of the pulp in the hole was controlled. Mr. Foss then asked if any operators present paid any attention to the sp. gr. of the churn drill pulp or do they control it by the eye. No one answered. D. O. DUNCAN, Ripplemead, Va., asked about the effect of a decrease in gauge and drag effect in the later stages of drilling. The speaker said they took that into consideration but that it did not seem important as the effects were small. He said the sp. gr. of trap rock sludges, for instance, should be higher than for such granitic rocks as those at Lithonia, Ga. The speaker was also asked how to control the gravity of the sludges, and he replied that this was through the control of the water added to the drill hole. He also mentioned that additives could be added to the drill sludges to increase the slip of the bit and in some cases decrease the "set" of some limestones.

Following the discussion of drill performances a mimeographed program was given those in attendance and outlined the topics for further discussions. This program was made up from a summary of questions submitted by operating men previous to the meeting. The chairman then went into the Topic No. 2 under the Quarry Section. It was, "What New Method of Blast Hole Drilling Has Been Developed." M. L. MCCORMACK, Ingersoll-Rand Co., told of the new "Quarrymaster" drill that had been developed by his company, a new and outstanding development. He said the drill would drill 6-in. holes as deep as any of the conventional drills. It was essentially a large, piston type air drill that could deliver 220 blows per minute which compared to 60 blows per minute of the conventional churn drill and resulted in far greater performances. He pointed out that the new Quarrymaster had controlled rotation so that each blow could be spaced to give the maximum cutting effect. He said the hole was continuously cleaned by exhaust air that went down through the drill column and the cuttings forced out of the hole. This blowing effect was synchronized with the drop of the bit so that the hole was always cleaned ahead of the drop of the bit. He said there were several types of drill bits available. T. C. COOKE, the presiding officer asked if this was an improvement on either wet or dry holes as regards wear on bits. Mr. McCormack replied that in normal crushed stone practice if the hole was kept clean there was very little difference whether wet or dry. In regard to the question as to depth of hole, Mr. McCormack replied that with a 6-in. bit the hole was from 75- to 80-ft. deep with 100-ft. depth being aimed at and readily passible. He mentioned that the bits used were standard types and that some experimental work was underway with tungsten carbide bits. K. M. CALLANAN, S. Bethlehem, N. Y., asked if the drill was for vertical holes only and the speaker replied that any angle hole could be drilled although with a flat hole the drag effect would be considerable. D. O. DUNCAN asked about the amount of air required and was told that spent air was exhausted through the hollow drill steel, and that the quarrymaster had a 500 c.f.m. compressor mounted but that 350 to 400 c.f.m. was all that was required to run the piston drill. The pressure was in the 95- to 125-lb. range.

M. BOVEE, General Crushed Stone Co., said that at one of their quarries on a hard sandstone they had increased the drilling rate 4½ times by use of the Quarrymaster over that of older drills and that in the latter case the holes were 5⅝-in. dia., and the Quarrymaster drilled a hole 4⅞-in. dia. at the start. The hole bottomed at ⅛-in. less dia. In answer to further questions on the size of drill, Mr. McCormack said the hole started at 4⅞-in. and ended at 4½- to 4⅝-in. dia. for a 60-ft. hole. He also pointed out that reduced speed of rotation may speed up gauge loss and that gauge loss is a factor of "time in the hole."

CHARLES W. BUCHLER, Bucyrus-Erie Co., told how improvements in their drill, mainly through increased weights per sq. in. of drill, had increased drilling rates at a New York Trap Rock Corporation quarry by 60 per cent and they were striving for an un-tapered hole. They would like to get to 12-in. dia. holes if powder loading and blasting conditions permitted, as this meant less lineal feet of holes to drill.

B. P. LANE, Sullivan Division of Joy Manufacturing Co., told of the progress being made with the Hughes type of rotary drill bit that is being used in the oil fields and that they had been particularly successful in some limestones low in silica. This drill rotates under pressure and uses from 50 to 60 gal. of water per minute in the drill hole. It could drill in the limestones referred to at rates of 2 to 3 times that of churn drills and could drill 12-in. holes without difficulty. In the discussion that followed on this rotary bit it was not recommended for extremely hard rocks. It made no difference if the ground was seamy as regards water, for it could go into caves or seams carrying the cuttings with it, or cuttings would plug up the seams.

On Question No. 3, "Does the saving in yield and improved breakage by dispersing dynamite in small bore holes off-set the added cost of drilling

them?" NELSON SEVERINGHAUS answered that his company was doing some work on this question and that so far the cost results were about the same when this cost is carried through the primary crusher operation.

To Question No. 4, "What methods are used to recover stuck drill bars?" there were no answers.

On Question No. 5, "How successful are carbide insert bits?" DEXTER BULLARD gave some experiences at the New York Trap Rock Corporation's operations, stating they doubled the footage compared to standard drills but they encountered excessive breakage of the shanks. These breaks were usually about 2-in. from the end of the drill. He said drilling in the hole set up excessive heat conditions. Mr. Severinghaus had similar experiences at his quarry and thought that this type of bit must wait for a better steel for stems. W. B. BOBBITT, Radford, Va., asked about the sizes of the tungsten carbide bits and Mr. McCormack replied that the 1½-in. dia. bits and smaller had proven quite successful and that in some drilling thirty times as much usage had been recorded over standard bits. On one rock where 2-ft. was standard for a bit, the tungsten carbide inserts gave 200 ft. of footage. Another producer gave his experience that paralleled the others and that he thought $9 to $20 per bit was excessive, and the bit manufacturer should charge the cost of their experimental work over a long period of time and not all to the few bits now being sold.

Plant Discussions

In this division, Question No. 1 was, "What is the best method to break jams in the primary crusher?" The chairman, Mr. Cooke, thought the best was to drill and shoot in the crusher. L. F. MILLER, Newburg, N. Y., said he did not follow this practice unless he had to. FRED H. EDWARDS, Meriden, Conn., said he used no dynamite but had feeders ahead of primary crusher so that by controlling rate of feed, few if any jams resulted and those that did occur were removed with a hook. Mr. Cooke gave his opinion based on his experience that the proper equipment for a sling or hook was an air-driven motor, for under excessive strains the hook would not straighten out or damage result, for an air motor had limits to its pull. GEORGE D. BECKER, Allis-Chalmers Manufacturing Co., asked if shortening the throw on a primary crusher would increase or decrease jams on either swing or gyratory crushers and it was the consensus of opinion that jams were pre-compression problems. Mr. Duncan said at the Virginia Limestone Co.'s operation they had a 48- by 60-in. jaw and shot the jams in the crusher. He said they had a feeder and that not size of stone, but two stones were more apt to cause jams and with good feeder control, jams were kept at a minimum. Another operator mentioned that he had a 42-in. gyratory and sometimes shot in the crusher. Reducing the speed cut capacity too much and reduced nip. He said it was not always the large stone but the shape of the stone that caused jams.

Mr. Edwards called attention to the new crusher that he had designed and which was on exhibition, saying that due to the horizontal throw of top and bottom sections of his crusher jaw, the chances of jams were reduced.

Question No. 2 under Plant Discussions was: "Discussions of water sprays vs. dust collection when recrushing." L. A. EIBEN, Northern Blower Co., said the basic idea was O.K. and it was a matter of the relative efficiency resulting from screening wet or dry rock. Mr. Edwards pointed out that water on the screen may or may not give the desired screen sizes.

Question No. 4 was, "Are totally enclosed screens better than home made enclosures?" and Mr. Cooke said that in his experience the home-made variety of enclosure was better. The lack of discussion on this question caused Mr. Cooke to remark that those sending in a question should at least take the floor to give their experiences in these discussions.

L. A. RHODES, Jeffrey Manufacturing Co., told about high calcium limestone fly dust being used as a filler in stock feeds and that material in the minus 100- to 200-mesh range was used and that some producers were getting fantastic prices for this material. Mention was also made that fine rock dust was being used in coal mines for rock dusting. Some fine rock dust had been shipped to a pressed brick plant but no report as to its use or success was available. MELVIN C. DOW, Newburgh, N. Y., told of disposal of some fly dust to ceramic plants where the material was used instead of higher priced ceramic clays. He said the pottery manufacturer found that it was 50 per cent cheaper than the clay, gave less shrinkage and less warp. WILSON P. FOSS, III, concurred in these statements, saying that the stone dust gave really extraordinary results. FREDERICK R. GRUNER, Allis-Chalmers Mfg. Co., told of the use of 35- to 48-mesh material, closely sized, for use in the manufacture of asbestos shingles and other cement-asbestos products. Mr. Cooke remarked that the subject was interesting because of the increasing number of dust collectors going into plants in the crushed stone field. WM. H. RUBY, Ft. Springs, W. Va., asked about where he could get dust collectors for wagon drills and another in partially answering the question, asked if there were any so-called "cups" for collecting dust from drills that could be used on vertical or angled holes; no answer.

Mrs. Irma R. Wilson, president, Granite Rock Co., Watsonville, Calif., new member of the N.C.S.A. board of directors

C. M. Sims and H. T. Dill, Campbell Limestone Co., Gaffney, S. C.

Harvey N. Clark, Dolomite Products Co., Rochester, N. Y.

Question No. 6 in the Plant Section was, "Will a dust screen deck bind less if coarse stone is passing over it?" Mr. Cooke said he was the one who filed the question because he was using fine screens with pads below and he was having terrific wear and tear. He mentioned that the angle of the screen was an important factor and that ⅝-in. stone had a scouring effect. Mr. Gruner pointed out that sometimes it was an advantage to have two single-decked screens "in line" rather than a double-deck screen so as to reduce wear on the finer sizes of screen. Shape of particle and the percentage of material going to the screen that was of the same mesh as the screen had their effects on this problem. It was Mr. Severinghaus's opinion that this question of wear vs. size was a balance involving the economics. Too much coarse gave excessive wear and good screening and too little coarse gave the reverse so the balance must be established by the operator.

Relating to Question No. 7 in the Plant Section, "What is the relative life of wearing parts in overhead eccentrics and Blake type jaw crushers?" Mr. Severinghaus said that they have an overhead eccentric and that it reduces the bridging effect of rock but the equipment has been in use too short a time to give an opinion as to relative wear.

Questions 8, 9, and 10 were omitted for lack of time. They were: "Why is some stone sand good and others bad?", "What is the best method of making stone sand out of run-of-the-bins screenings?" and, "Is it possible to re-shape stone sand particles?"

How Aggregates Affect Durability of Concrete

C. H. SCHOLER, Professor of Applied Mechanics, Kansas State College of Agriculture and Applied Science, presented an interesting address on "How Aggregates Affect the Durability of Concrete" which he illustrated with several slides. Prof. Scholer pointed out that 100 years' experience proved the durability of concrete. During the past 25 years, however, more thought is being given to factors which determine durability. Some engineers hold to the belief that concrete placed 20 to 40 years ago is more durable than concrete laid down in recent years, but more severe traffic conditions, heavier wheel loads, and the use of salts and other chemicals for snow and ice removal have contributed to shorter life. He said that it is now known how to design concrete with adequate strength, both flexual and compressive, and elastic properties, but we are not very well informed on how to control absorption, the exact ratio of air to water voids or to measure the amount of freezable water that may be in the concrete at any particular time.

Prof. Scholer said that the very wide variation in fineness of cement in the last 25 years may be an important factor in contributing to the durability or lack of durability of our modern concrete. Concrete of 25 or more years ago was made with much coarser cement than today. He questioned the statement that we are now using drier concrete than we were 25 years ago, pointing out that the finer cement with air entraining agents will make the resulting paste and mortar more water retentive and the excess of water that may be present will not be observed. With the old coarse cements, it was impossible to retain much water in the mortar.

In the matter of aggregates, it is now known that both fine and coarse aggregates play a significant part in the durability of concrete; mineral composition, particle shape, surface characteristics, gradation, soundness, chemical activity and physical properties, all having a bearing. Sands having a low modulus of elasticity are much more likely to cause concrete with large shrinkage factors. Variation in soundness and the quantity of soft deleterious material in coarse aggregate is likely to be larger than is the case for fine aggregate. In Kansas it has been indicated that the maximum size of coarse aggregate should be reduced if the aggregate is of questionable soundness, and the highway commission is now specifying a maximum size of one inch for all concrete aggregate in concrete required to withstand severe weathering conditions. Prof. Scholer, referring to chemical activity of the stone, pointed to the studies in California where certain rock sources have been the cause of concrete failure. In contrast, Kansas has determined that as little as 10 per cent addition of certain limestones has reduced materially the destructive chemical reaction. He showed slides of pavement failures in Kansas and mentioned the types of aggregates involved.

Mrs. Morris E. McLean, Miss Marie B. White, and Mrs. Wm. E. Hewitt, who lent glamor to the East St. Louis Stone Co. delegation

America's Secret Power

ROBERT W. WATT, manager of Publications and Research, New Jersey Manufacturers' Association, gave a very inspiring address on "America's Secret Power." He said that this secret power is not in the possession of the atomic bomb or bacterial warfare, but the true power lies in public opinion. He said that for the past 16 years, the idealogical emphasis has been on a socializing policy. He said 36 million Americans have distorted ideas as a result of this impact. A recent poll showed that one out of three of the working populace believed that the government should control everything and all our problems would be solved. This and other similar beliefs indicate that this opinion is so widespread that it must have been "planted."

To counteract this misinformation, his organization has sponsored a plan on a county level basis for the formation of groups who go out to tell factual information on the American way of life in simple form. Speakers kits are furnished and posters are supplied to be used as visual aids in bringing home simple truths.

Interregional Highway System

E. H. HOLMES, Chief, Division of Highway Transport Research, Public Roads Administration, F. W. A., told about the plans for an interregional highway system and the federal aid secondary road program. Mr. Holmes reviewed the studies which led up to this program in the report of 1944. These studies showed conclusively that need for greater concentration of highway activity was in the areas near cities where the greatest volume of traffic originated.

It was finally concluded that a system of 34,000 miles, 29,500 rural and 4500 urban, would accommodate on its rural portion an average traffic in 1941 of 2660 vehicles per day, providing the most effective service per mile. It would serve all cities of 300,000 population or over, all but three between 100,000 and 300,000, and over half of all cities of 10,000 population or over. Road designs provided lane widths of 12 ft. and 10 ft. shoulder except in mountainous areas. Two lanes or more in each direction were to be required where traffic volume exceeds 3000 vehicles per day. The act of 1944 now limits the program to 40,000 miles in length, and designates that 233,000 miles of federal aid system highways are of first national importance. The act authorizes an expenditure of $125,000,000 for each of the three years covered by the act for expenditure within urban areas. The 1944 act provides that secondary roads receive an authorization to spend $150,000,000 annually. For this type of road, the standards call for surface widths of 12 ft. on 20-ft. roadbeds. The total mileage of roads eligible for federal aid is now approximately 600,000, about 20 per cent of all road mileage. This 20 per cent serves 80 per cent of the traffic.

The Modern Macadam Road

FRED E. SWINEFORD, engineer-director, Macadam Pavements, Inc., Columbus, Ohio, presented a very interesting illustrated talk on macadam pavements. Mr. Swineford said that the principle of design of this type of road provides that the wheel load be transmitted through the macadam and over the subgrade in the form of a frustrum of a cone with 45 deg. sides. The top of the frustrum of the cone is the bearing area of the tire on the pavement and the base of the cone is the area over which the load is distributed on the subgrade. Mr. Swineford cited an example of a macadam pavement 10 in. thick which transmits a 5000-lb. load through a frustrum of a cone to an area 707 sq. in. on the subgrade at an average of 7 lb. p.s.i.

Mr. Swineford showed several slides of typical macadam pavement cross sections. He said that the modern macadam pavement is constructed of one or more courses on a stable subgrade and surfaced with a bituminous wearing course. A typical macadam pavement consists of two 4- to 5-in. courses of crushed stone with a predominating size between 3½-in. and 1½-in. Each course is keyed and compacted by rolling to form a solid mass. Bonding is usually accelerated by adding water during and after filling with screenings. One or more courses may, if desired, be constructed of bituminous macadam by the penetration method, using asphalt or tar as a binder. A layer of 1- to 2-in. stone screenings placed on the subgrade is recommended. This layer of screenings prevents any subgrade from being forced up into the course and helps to fill the lower part of the course. Upon the two base courses, a 3-in. course of 2-in. to 1-in. crushed stone is spread, rolled and compacted for the bituminous macadam wearing course. This course is bound and sealed with hot asphalt, hot tar or asphalt emulsion. After each application of bituminous material, crushed stone chips are applied to fill, key and surface the course.

At the close of Mr. Swineford's talk, he showed slides of typical Ohio macadam construction and a colored movie made by the Ohio Highway Department to show various types of equipment in action placing macadam roads.

Mr. and Mrs. W. B. Bobbitt, Radford Limestone Co., Inc., Radford, Va., with Miss Marie Marshall, Mr. Bobbitt's secretary, left front, and Esther Graham, daughter of the Bobbitts

Newly-elected chairman, Manufacturers' Division, N.C.S.A., left, with retiring chairman, J. B. Terbell

Labor-Management Relations

JOHN C. GALL, attorney, Washington, D. C., gave a very concise analysis of the Labor-Management Relations Act of 1947, generally known as the Taft-Hartley Act at the Wednesday afternoon session. Mr. Gall pointed out that important questions of interpretation and application are still arising before administrative agencies and the courts with respect to the Wagner Act, passed in 1935; the Walsh-Healey Act, passed in 1936; and the Fair Labor Standards Act, passed in 1938; and it is expected the Taft-Hartley Act will be subject to similar interpretation as time goes on. Union leaders, he said, had conducted a campaign of deliberate misinterpretation, exaggeration and confusion with respect to the Taft-Hartley Act. It is not in any sense a "slave labor act" as union leaders have characterized it, and on the other hand, it is not a 100 per cent cure-all for the rash of strikes and other ills which preceded passage of this legislation.

Two of the important problems, said Mr. Gall, that are not dealt with by the Act involve mass picketing, violence and physical coercion on intimidation or the problem of labor "monopoly" typified by industry-wide bargaining and industry-wide strikes. Other problems dealt with in the Act, but which will be given further study by a congressional committee are:

(1) "Emergency strikes" involving whole industries; (2) "union security" in the form of the union shop, compulsory maintenance of union membership, hiring halls, etc.; (3) union welfare funds, which are still permitted, and which may prove to be against the public interest unless further safeguards are adopted; (4) feather-bedding and "made work" practices which are costly and anti-social; and (5) the problem of organization of foremen and other segments of management.

(Continued on page 131)

Delayed Action Blasting

T. C. COOKE AND NELSON SEVERINGHAUS were co-chairmen of a session devoted almost entirely to discussion of delayed action blasting. A panel of experts was on hand to lead the discussion and answer questions, including Dr. L. Don Leet, seismologist, Harvard University, Cambridge, Mass.; Jules E. Jenkins, Vibration Measurement Engineers, Chicago, Ill.; L. F. Miller, New York Trap Rock Corp., Newburgh, N. Y.; Harold Williams, attorney-at-law, Boston, Mass.; and J. R. Thoenen, U. S. Bureau of Mines, University, Ala.

T. C. COOKE, in introducing the speakers on the panel, said, as was borne out in the discussion that followed, that the new technique of split-second delayed blasting had proved beneficial to the crushed stone industry almost 100 per cent. He urged that bad as well as good experiences with this method of blasting be brought out in the discussion.

L. F. MILLER, who probably has done more actual plant research in application of short-time delay blasting than anyone else in the industry, started the program off by citing a few ridiculous complaints of damage due to blasting that had been made, to give emphasis to the problem facing the industry.

A year ago he talked about the fundamental principles in Chicago and since then has had a year of concentrated plant experience toward perfection of the process. He insisted that any method of delayed action blasting, whether done by Primacord or switches even of the hand-operated type, will improve plant operation in most cases. The vibration problem has been solved, he said, and breakage of stone will be improved in most cases unless results be already nearly perfect. Most of his work the past year has been directed to improve breakage.

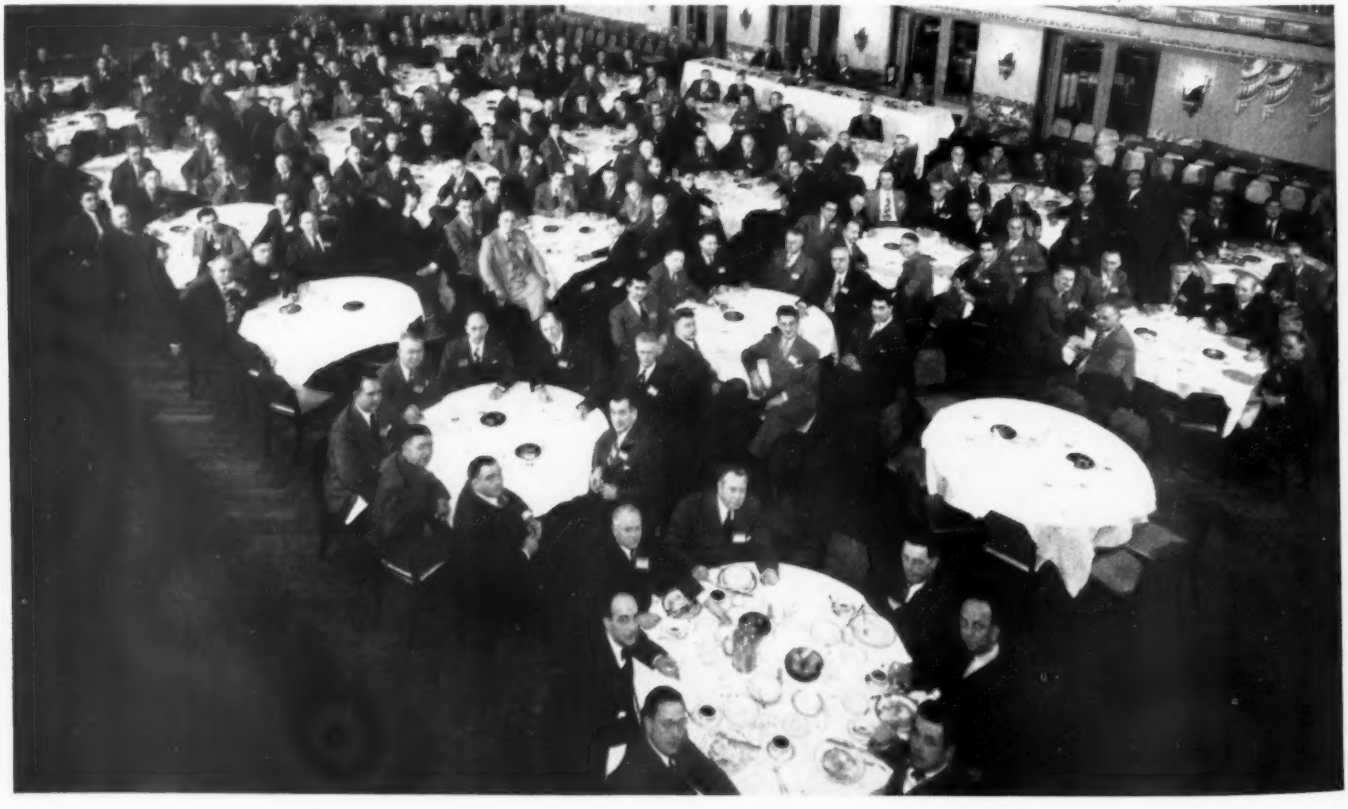
Mr. Miller's opinion as to why better breakage is obtained by the use of the new blasting technique is that as one hole fires, causing a decoupling (a term credited to Dr. Leet) the next hole to fire, instead of firing directly toward the fact, expends a large part of its explosive energy in the direction of the hole that has previously fired. Photographs taken showed by whirling action (see front cover, this issue) that this exertion of energy continues for the full length of a shot.

An important point brought out from his experience was that by shooting a number of holes in a row and reducing the end breakage over a distance of 400 ft., the secondary drilling would be only the same as if two or three holes were shot. Another important saving was in the fact that power shovels could start loading stone immediately after a shot, without exception in his company's plants throughout 1947. He told of cases where production had been increased as much as 70 per cent.

Mr. Miller touched briefly on a court case against his concern to emphasize the value of controlled blasting in suits claiming damage from vibrations. A favorable decision was handed down after the judge had seen how blasting is done. The records of the company were accepted in their entirety by the judge. He briefly mentioned his technique of photographing shots to show what actually takes place in delayed action blasting. Several of his photographs are shown herewith. In concluding, he urged that all quarry operators try this technique of blasting and volunteered his help.

Replying to a question as to whether the method is as effective with soft stone as with very hard and tough stone, Mr. Miller said that the more effective breakage throughout an entire shot will be found in the harder stones. However, very excellent breakage is also obtainable in all hardnesses of stone, even in the soft limestones provided it is a solid mass in the bank. In soft stone, he believes that a slower time delay than would be used in a harder stone will give better breakage.

Mr. Cooke reported excellent experience in extremely hard stone. Prior to adoption of this blasting technique, as much as 25 per cent of the tonnage had to be broken again by secondary drilling and blasting to pass a 48- x 60-in. jaw crusher. Now, operation of a drop ball has been cut from eight or nine hours a day to two hours.



Manufacturers' Division luncheon with officers seated at speaker's table, to the right

Mr. Jenkins pointed out that the blasting pattern optimum results must be worked out for each individual quarry. He also believes that opinions as to burden and hole spacing are at the point of revision and that it will be up to quarry operators to experiment with various hole spacings and burden in efforts to arrive at optimum practice. Thirdly, he expressed the opinion that the vibration problem is largely psychological rather than seismological.

In reply to a question whether any quarry operator had made progress toward increasing burden and spacing along with delayed action blasting, a midwestern producer of crushed limestone said that secondary shooting had been decreased 50 to 60 per cent and that he had increased burden 25 to 30 ft. A cap is used, the holes are stemmed and Primacord is also used as a safety measure. Spacing is 20-22 ft. and the holes are 120 to 130 ft. deep.

A Southern producer of crushed dolomite told of his experiences, having adopted short-time delay blasting after the Chicago convention a year ago. He had been drilling 6⅝-in. holes, 263 ft. deep., with 35-ft. burden on 15-ft. shelves of dolomite. Due to complaints that vibration was causing damage in the nearby town, the company was faced with the likelihood of cutting its blasts from 10 to 15 holes at a time to one, which would have been disastrous. With the new technique, practically all secondary shooting has been eliminated and the next shot will likely be eight holes at 353-ft. depth. There have been no complaints following two large blasts thus far. An Eastern producer of crushed limestone told of specific cases where results were unsatisfactory but agreed that delayed action shots, when properly handled, are beneficial.

One producer reported practice of shooting off holes from both ends of a row toward the middle, as a sequence, because of better breakage. It was suggested that drilling below grade may be responsible for increasing the vertical component of amplitude of vibration as measured by instrument. In reply, Mr. Miller said that drilling below grade is essential to quarry efficiency and must be practiced at the expense of a little higher reading.

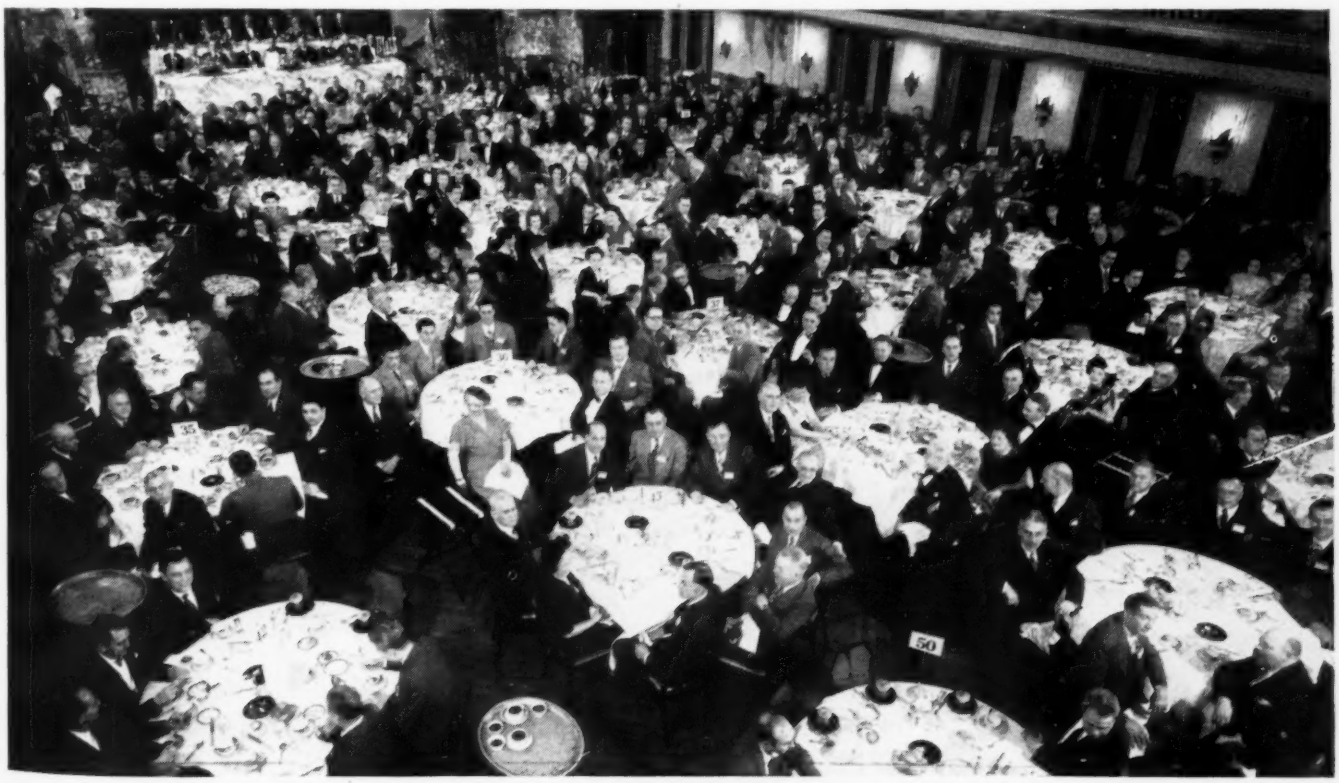
Hole spacing and burden came in for much discussion. One producer told of shooting delayed action blasts with burdens double the spacing and the other way around, with very little difference in fragmentation observed. Very little difference in vibration likewise was noted. Another suggested that by drilling on a curve, better fragmentation might be achieved, as he noted in his last blast. Further comment developed that when shooting in sequence with one end of the shot in a corner, the stone will actually shift away from the corner toward the direction that detonation was started. A corner can be swept out clean due to this shifting.

As to different loadings of holes, Mr. Miller's experience, based on shooting a tapering bank ranging from 40 or 50 ft. up to 140 or 150 ft. high, is that much better results are obtained all around when the holes are shot in sequence starting from the high bank with deeper holes. His experience has been that it is best to shoot a series of holes from one end to the other in a single sweep.

Mr. Williams was asked to comment whether or not delayed action blasting with proper seismographic records would help in legal cases. He said that anything that reduces the amount of vibration displacement or acceleration, as proved by seismograph, will simplify the problem of defense against damage claims. Commenting on air concussion in reply to a question, he said that the amount of surface shooting in the crushed stone industry is so small that its effects are positively negligible. The trouble, as pointed out by others, is that people think the noise from blasting is what bothers them.

J. R. THOENEN commented on the fact that most window panes have become loosened which permits glass to rattle easily and cause noise even where there is no damage. In discussing delayed action blasting, he commented that best results come in proportion to the number of free faces to which the powder can break. When one hole is shot, a third face for the following shot to break to is provided.

Faulty structures that, because of their defects, exhibit excess vibration oftentimes enter into litigation. Mr. Jenkins recommends, in such cases, engaging the services of a structural engineer to uncover defects which contribute to undesired effects. The haz-



Banquet of the National Crushed Stone Association and Agricultural Limestone Division

Two 8-hole shots (dolomite) were set off side by side in this New York Trap Rock Corporation quarry, showing comparative results. On left was split-second delay shot; on right, may be seen results of an instantaneous shot. Each shot had 8000 lb. explosives and yielded a 4 to 1 ratio. Note fragmentation on left as compared to that on right

ards of having great numbers of wires on top of a ledge were discussed. When holes are hooked up for shooting and tested, Mr. Miller recommended that no one be permitted to go into that area until after the blast is fired. It was also suggested that a bright color be provided on the lead wires by manufacturers.

The discussion of short time delay action shooting concluded with a discussion of the vibration effects by Dr. Leet. He discussed the various theories as to what actually occurs when this technique is used to reduce vibration effects and reviewed much of the research and development work toward developing blasting practices to minimize vibration effects.

Rubber tire takes shock from the shovel boom

The Bureau of Mines has found early that when each of several holes was detonated by a cap of the old type delays, that shooting the holes in sequence had the same effect as if they had been fired one on each successive day. The vibration pattern from the first shot is gone before the vibrations from the second shot reach the point. The Bureau's development work with shorter time intervals subsequently was reviewed briefly, which was followed later with development of a type of cap by a powder company which had a shorter time interval that produced desired results.

Dr. Leet then offered his theory of why this latter development worked. He believes the reduction in vibratory waves occurs right at the shot and that the rate of breaking is transmitted through the rock at a rate of speed of possibly about 1000 ft. per second rather than the 10,000 ft., which is the approximate rate of the compressional wave coming from dynamite explosions. It has only to do with the speed at which fracture travels through rock and, in his opinion, has nothing to do with the speed at which sound waves travel in the rock. Discussing his theory further, the first hole to detonate has produced shattering of the rock in its vicinity and the gases from the second hole move in part into an area already shattered. This, he theorized, breaks the stone further, dissipating energy without producing an appreciable effect on the solid unbroken bank back of the shot, which is the occurrence that produces vibration.

The drop ball was briefly considered. A new idea illustrated herewith is the use of a rubber tire between the crane hoist cable and the ball at the quarry of Harry T. Campbell Sons' Corp., Towson, Md. The tire takes about 80 per cent of the shock out of the boom.

R. W. Cunningham and G. R. Gilbertson, Canada Crushed Stone, Ltd., Dundas, Ont., Canada

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Industry Must Concentrate On

SALES PROMOTION

Agricultural Limestone Division, National Crushed Stone Association convention gets first hand report on legislation and selling aids to industry

NEARLY 300 members and guests attended the Agricultural Limestone Division convention on January 29 and 30 at the Netherland-Plaza Hotel, Cincinnati, Ohio, immediately following the annual convention of the National Crushed Stone Association. The manufacturers' exhibit was an added attraction this year which helped to swell the attendance.

New Officers—Directors

Final piece of business of the meeting and of the convention was the election of officers and new members to the board of directors for the Agricultural Limestone Division of the National Crushed Stone Association. Duly elected chairman for the new year is H. C. Krause, Columbia Quarry Co., St. Louis, Mo. Russell Rarey, Marble Cliff Quarries Co., Cleveland, Ohio, was elected to represent the National Crushed Stone Association on the board of the Division.

Members newly elected were the following:

Regional Vice Chairmen: Northeast Region — Ellwood Gilbert, New Castle Lime & Stone Co., New Castle, Penn.; East Central Region — Earle L. Dingle, Harry T. Campbell Sons' Corp., Towson, Md.; North Central Region—W. F. Sharpe, Dillon, Sharpe & Co., Columbus Junction, Iowa; Southern Region—C. M. Sims, Campbell Limestone Co., Gaffney, S. C.; and Western Region—John J. Stark, Girard, Kans.

Board of Directors: Northeast Region—Otho M. Graves, General Crushed Stone Co., Easton, Penn.; East Central Region—Cale P. Haun, Franklin Limestone Co., Nashville, Tenn.; John Rice, Liberty Limestone Corp., Buchanan, Va.; Grove White, M. J. Grove Lime Co., Stephens City, Va.

North Central Region — Larry E. Fay, Material Service Corp., Chicago, Ill.; B. G. Lindenfeld, Terminal Materials Co., St. Joseph, Mich.; Roger E. Meshberger, Meshberger Stone Co., Columbus, Ind.; S. P. Moore, Concrete Materials & Construction Co., Cedar Rapids, Iowa; A. Overgaard, A. Overgaard Rock Products, Elroy, Wis.; W. R. Sanborn, Lehigh Stone Co., Kankakee, Ill.; Norbert F. Schwarz, Pontiac Stone Co., Pontiac, Ill.; W. F. Sharpe, Dillon, Sharpe & Co., Columbus Junction, Iowa; Wm. J. Stoffel, Dolese & Shepard Co., Chicago, Ill.; Southern Region — H. M. Hubbard, Willingham-Little Stone Co., Atlanta, Ga.; Western Region—No new members elected.

CHAIRMAN S. P. MOORE welcomed the members to the third annual convention and expressed his thanks for the splendid cooperation of the members in supporting the officers and directors, both financially and in service. He then called for the report of Managing Director, HENRY A. HUSCHKE.

Managing Director's Report

In his very complete report of activities, Mr. Huschke reviewed the status of legislation affecting the agricultural limestone industry. He recalled the House and Senate actions on the appropriation bill which finally resulted in the passage of the bill appropriating $228,000,000 which, with $37,000,000 of other money available, provided $265,653,044 to pay for the 1947 program. Each member of the Division, he said, had been provided with a voting record of congressmen and senators. Mr. Huschke said that on the basis of voting records for the conservation program, more Republican favorable votes will have to be obtained, and the greatest concentration of effort must be made in the agricultural midwestern states. In only two of those predominantly Republican states, Iowa and Wisconsin, did a majority of the Congressmen vote favorably, at least part of the time. The voting record of the Senate was excellent, he said. Mr. Huschke said that the favorable attitude of the Senate and the closeness of the vote in the House leads to the belief that the $150,000,000 commitment for 1948 may yet be changed to a larger actual appropriation. The President has asked for $300,000,000 for 1949, a figure much larger than has been requested for several years. Mr. Huschke stressed the point that the indirect approach of the Division on legislation through member contacts with farmers and others in the home district of Congressmen and Senators has been the most effective way of presenting to legislators the need for substantial appropriations for soil conservation.

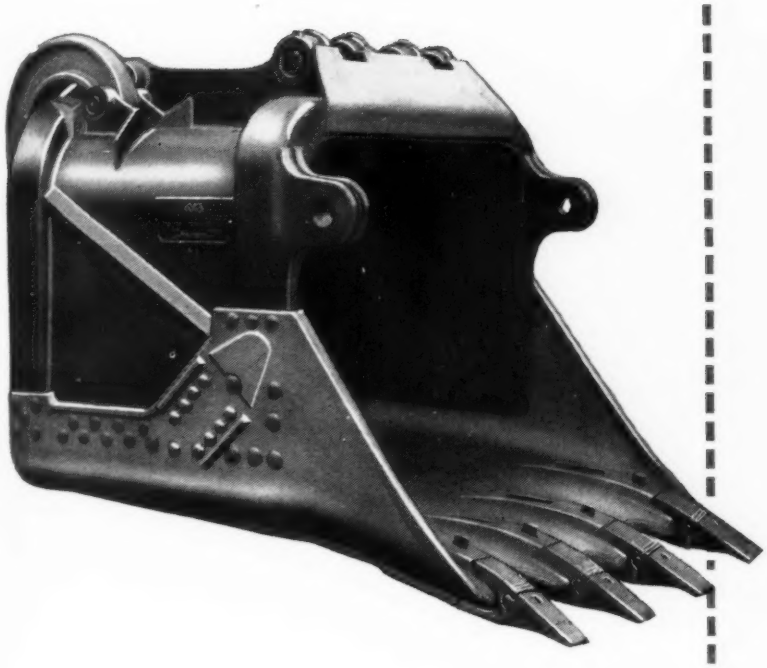
On the subject of freight rate increases, Mr. Huschke recalled that the railroads had filed three petitions; one on July 3, 1947 for an increase up to 20¢ per ton; the second on September 5 requested 30¢ per ton; and the third, on December 3, asked for 41 and 31 per cent with the limit for crushed

(Continued on page 122)

Horace Krause, newly elected chairman of the Agricultural Limestone Division, N.C.S.A.

Mr. and Mrs. Merrill M. Green, Lime & Rock Co., Carrollton, Mo.

J. F. McDonnell, Lynwood Stone Products Co., Davenport, Iowa, and Tom N. Hudson, Hudson Stone Products Co., Lynchburg, Ohio



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For extremely severe service. ⅜ to 5 yards.

MEDIUM WEIGHT DRAGLINE
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STANDARD TYPE DRAGLINE
For tough digging jobs. ½ to 18 yards.

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For the very hardest digging. ¾ to 10 yards.

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Please send us information on ☐ Cast-Welded Dippers. ☐ All-Cast Dippers. ☐ Coal Loading Dippers. ☐ Medium Weight Dragline. ☐ Standard Type Dragline. ☐ Heavy Duty Type Dragline. ☐ Stripping Dragline Buckets

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stone and agricultural limestone set at 33¢ per ton. The Agricultural Limestone Division board of directors employed counsel to protest this increase on the argument that such low-priced products cannot stand the increases requested and also that every time rates are raised, more traffic is driven off the rails to other modes of transportation. The I.C.C. granted a temporary increase of 10 per cent on October 6, 1947, a second temporary increase of 20 per cent on December 29, 1947 to take the place of the 10 per cent increase. This action, said Mr. Huschke, foreshadows a final decision on Ex Parte 166 favorable to the railroads, but it is hoped that the Division's arguments will hold the increase to a minimum.

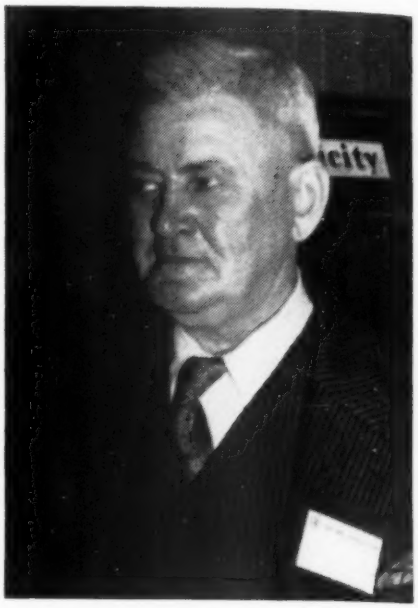
Mr. Huschke also outlined in his report the promotional activities of the Division including: bank ads, newspaper ads for members, folders promoting the use of agstone for particular purposes, invisible ink post cards, and the National Farm Show exhibit in the Coliseum in Chicago. This exhibit was held at the same time as the International Livestock Show. Financing of this exhibit was through voluntary contributions from members and the Midwest Agricultural Limestone Institute. The Board of Directors has voted to consider participation in a similar exhibit next year.

Among the other activities listed by Mr. Huschke was the distribution of a membership plaque to all members, to be displayed in their places of business. Membership now comprises 221 members, as of January 1, consisting of 190 actives and 31 associates, a net gain of four. At least five additional members were added at the meeting. Mr. Huschke also called attention to the new building purchased by the National Crushed Stone Association which will provide excellent office facilities for the Division. The members were invited to visit the new office and make use of its quarters.

J. R. Boyd, secretary-treasurer of the Division, presented his report which showed that a deficit of $1500 had been wiped out with revenues from higher dues, and a balance of more than $1500 in the bank at the first of the year was reported. Mr. Boyd also referred to the work of the committee assigned to present a case for Percentage Depletion for the limestone industry in Congressional hearings. This allowance for depletion has been granted to producers of coal, talc, fluorspar and many other minerals, and it is believed the industry has a good case.

Soil Conservation Program

Thos. L. Ayers, Planning and Marketing Division, Soil Conservation, Department of Agriculture, was called upon by Chairman Moore for an unscheduled address on the aims of the soil conservation program. Mr. Ayers pointed out that it takes three things to do anything: (1) a desire to do it; (2) the means to do it; and (3) knowledge as to how it should be done. The soil conservation program is to try to provide part of the means. He said that with 5 or 6 million farm units, it is difficult to get the farmers to do the required job, and the producers of agstone through the association can help to promote the program. It is estimated that from 52 to 62 million tons of agricultural limestone are required annually, but Mr. Ayers said that this amount is not needed unless some other things are done. He said that very often other minerals, such as phosphates, nitrogen, and potash, are needed along with agricultural limestone to do an effective job. Mr. Ayers cited one case where lack of potash caused a cotton crop failure although an adequate amount of agricurtural limestone had been placed on the land. Mr. Ayers pointed to the trend to reduce federal aid in favor of local effort, but questioned whether the program could be sustained on this basis. The program also now emphasizes the allocation of funds on the basis of actual need in the counties and states. There are a number of misconceptions concerning the program, and a belief has grown up in some quarters that it is designed to take funds from the cities for rural purposes. This, of course, is not true, as the program is designed to help the farmers do something which they could not do for themselves and in the end results in general welfare to the entire nation.



Wm. H. Petri, Hopkinsville Stone Co., Hopkinsville, Ky.

At the conclusion of Mr. Ayers' talk, Chairman Moore introduced several well-known state association executives, including Paul Doll, secretary of the Missouri Limestone Producers Association; M. L. Barnes of the Department of Agriculture and others.

Sales Philosophy

Judd C. Benson, general manager, The Union Central Life Insurance Co., gave an interesting address on, "Your Sales Philosophy Is Important." To illustrate the urgent need for restoring minerals in the soil which have been removed by the crops, Mr. Benson told the story of a boy who was convicted by a jury of farmers of stealing a load of corn. Each farmer on the jury who convicted the boy probably "stole" about 15,000 tons of calcium, magnesium, phosphate, potash, and nitrogen. Mr. Benson said that the deserts of Northern Africa were in ancient times the granary of the Roman empire and serve today as a stark example of careless treatment of soil resources. The need for increasing production of food is greater today than it has ever been. Medical science, he said, had increased the life span more than 20 years by saving the lives of children and lengthening age. There has been a 60 per cent increase in the number of people over 65 years of age. Both children and the aged consume food but do not produce it. It has been estimated that in this country we are destroying our soil resources at the rate of 500,000 acres a year. This loss must be arrested if we are to continue

(Continued on page 126)

Mr. and Mrs. Wm. J. Stoffel, Dolese & Shepard Co., Chicago, Ill.

By either method...

STOODY ALLOYS double crusher life, cut maintenance costs!

With the introduction of several new Stoody hard-facing wires, Stoody Hard-facing Alloys can now be applied automatically as well as manually! These wires, available in several alloy analyses, are fabricated in coil form; feed continuously from rolls to an automatic electric welding head. The arc may be either open or submerged, as required. Speed of application is tripled with far greater uniformity and with marked savings.

Using either automatic or manual welding methods, Stoody Alloys conservatively double life of crusher parts and similar heavy equipment; unnecessary downtime is avoided and crusher efficiency maintained. When the hard metal wears away it can be re-deposited with a similar life increase.

Application methods for manually hard-facing crushers and other wearing equipment are fully described in the Stoody Hard-Facing Guide Book. "Stoody Alloys for Automatic Electric Application" is printed in a separate circular. *Write for both copies today.*

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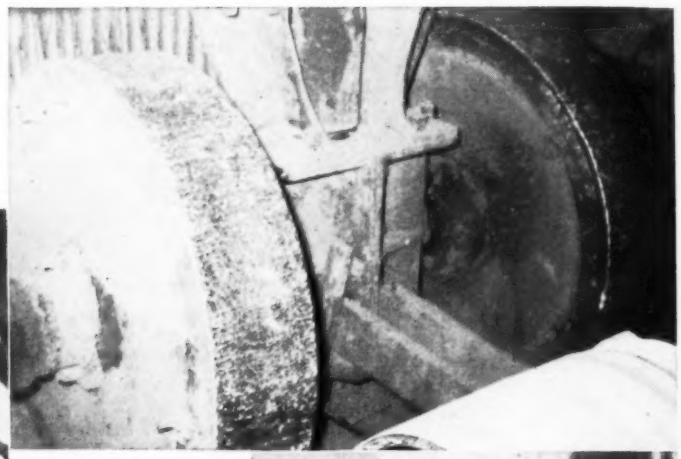
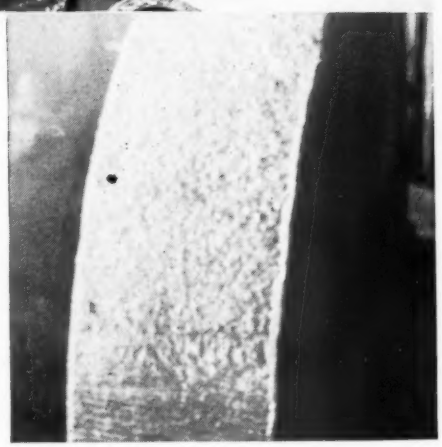
MULLER RINGS and TRUNION ROLLERS

in CEMENT PLANTS and SMELTERS

The Muller tires (photo right) rebuilt with ISOROD self-hardening (parent metal cast steel carbon .60 - .70) are still grinding and crushing efficiently after nearly a year of continuous service with no maintenance.



The Trunion rollers (photo above) were rebuilt with TWO-TONE H.C. and in pairs support a large rotary cement kiln weighing several hundred tons. Photo taken after 8 months continuous service. No checking, spalling or cracking of deposited metal evident. Average life expectancy without repairs 4 years minimum.



Close-up photo at right of same Muller tire shown in top plate, showing excellent condition after a year's service. Note there is no edge spalling or center cavitation.

The use of ISOROD on steel Muller tires actually gives you the service that others think about getting and cuts your maintenance costs in half. Note the excellent surface after months of service, to grip and grind the material quickly, giving you increased production efficiency and lower costs. Extend the life of and increase the efficiency of bottom plates and plows by using ISOROD for rebuilding same.

FLINTYPE VH is used on chilled cast iron Muller tires with comparable efficiency.

TWO-TONE H.C. is easily applied to Trunion rollers and the cost of rebuilding, including grinding to a perfect surface, is less than half the cost of new rollers. Rebuilt rollers will outlast new rollers three and four to one.

IT WILL PAY YOU TO INVESTIGATE

Write our nearest representative and he will show you

Eastern Representative: Turney & Beale, 40-48 Cpl. Kennedy St., Bayside, New York
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South-Central Representative: Barney E. David, 518 E and C Bldg., Denver, Colo.
Mid-Western Representative: Red Arrow Sales Corp., 12 So. Livingston St., Madison 3, Wis.
Western Representative: L. R. Edminster, 2751 S. W. Hume Ct., Portland 1, Ore.

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The cumulative backlog of proposed engineering construction will require sizeable quantities of cement, lime, plaster, mortar and other building materials.

Here are some of the figures, taken from a recent issue of Engineering News-Record:

CLASS of WORK	BACKLOG *(Figures are in millions of dollars)*
Waterworks	$1,179
Sewerage	2,168
Bridges	1,368
Earthworks — drainage	7,595
Streets and roads	4,247
Public buildings	8,267
Industrial buildings	3,526
Commercial buildings	4,623
Unclassified	7,731

That adds up to a total of over *forty billion* dollars! It means a lot of material . . . employment . . . prosperity.

And it means a great volume of packaging in St. Regis multiwall paper bags — ideal containers for building materials. As you know, multiwalls teamed up with high-speed St. Regis packers make an extremely efficient, economical packaging system.

From wood to pulp to paper to bags — every link in the St. Regis chain is doing its best to supply you.

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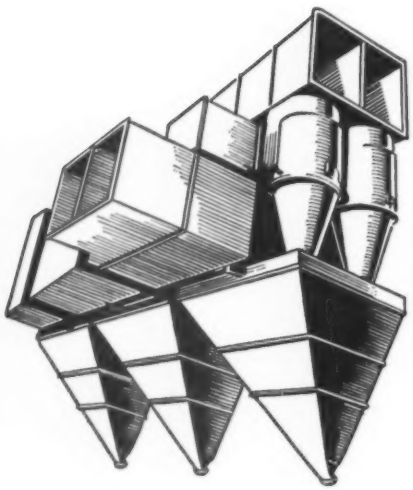
PRECISELY WHAT IS YOUR dust— recovery PROBLEM?



You call a doctor

when you're sick—why not call upon engineering specialists to determine—and *solve*—your dust-collection problem? In the past 10 years, the Buell Engineering Company has designed and installed thousands of dust-collection systems, each planned to solve an individual problem. Each situation was different, because a broad range of industrial uses was covered. The engineering know-how behind Buell design successfully meets difficult conditions imposed by size and shape of available space, unusual dust compositions, and widely varied gas volumes. Furthermore, the Buell van Tongeren design eliminates plugging. It's all in the new 32-page catalog—write: Buell Engineering Co., 2 Cedar St., Suite 5000, New York 5, N. Y.

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Engineered Efficiency in DUST RECOVERY

Agstone

(Continued from page 122)

to feed our growing population and supply deficient areas of the world with our surplus products.

Turning to the question of selling soil conservation to the farmer, Mr. Benson said that sales promotion to farmers should go beyond the mere thought of increasing productivity, but should be expressed in terms of saving people from starvation. He said that there are two kinds of selling: (1) creative selling, and (2) exploiting the existing market. He listed seven points required to make a good salesman: (1) character; (2) selling is a hard job requiring determination; (3) alertness; (4) must have vision; (5) must have a sense of dramatics; (6) a sense of humor. Salesmen, he said, must be physically fit, have good mental health, work for rewards, and it is essential to emphasize the good points of the salesmen because we all fall short of perfection. With the announcement of the nominating, resolutions, and auditing committee, the meeting adjourned.

Limestone Use in Kentucky

Speaking on soil conservation practices in the State of Kentucky, W. C. JOHNSTONE, field agent in agronomy, University of Kentucky, Lexington, Ky., introduced his remarks by saying that while all problems of his state were not those of other states, there was sufficient similarity to make the study worthwhile. In Kentucky, 45 per cent of the population lives on the soil, 75 per cent of all income is derived from the soil. Mr. Johnstone presented colored slides that graphically showed the results on the experimental farms as well as elsewhere in the state of crops grown on soil with agricultural limestone added as opposed to crops grown without the benefit of this land care.

Other slides dealt with such matters as contour farming as opposed to row farming, crop rotation and proper land use. The major problem, according to Mr. Johnstone, was education of the farmer in the proper forms of land care.

Liming Ohio Soils

Soil conservation, as practiced in Ohio, was the next address, presented by DR. R. E. YODER, principal agronomist, Ohio Agricultural Experiment Station, Wooster, Ohio. The four interrelated cornerstones of soil conservation were spoken of by Dr. Yoder as, (1) addition of adequate amounts of agricultural limestone, manure, and other additives to replenish those chemicals removed from the soil by constant farming; (2) crop rotation, use of legumes, etc.; (3) type of tilling—i.e., contour farming, etc., where needed; and (4) proper land care, which covered use of land for that for which it was best adapted, etc.

(Continued on page 128)

Can you Answer these Questions about HAMMERMILLS?

Q. *What are some of the important differences in various makes of hammermills?*

A. First and foremost is the degree of resistance to clogging when the material has high moisture content. Other differences involve: drying costs, capacity, power consumption, range of reduction, etc. All are important in terms of greater production at less cost.

Q. *Has this difficulty been successfully overcome?*

A. Yes . . . by the development on the part of Dixie engineers of a vastly improved crushing principle known as the Dixie Continuously Moving Breaker Plate.

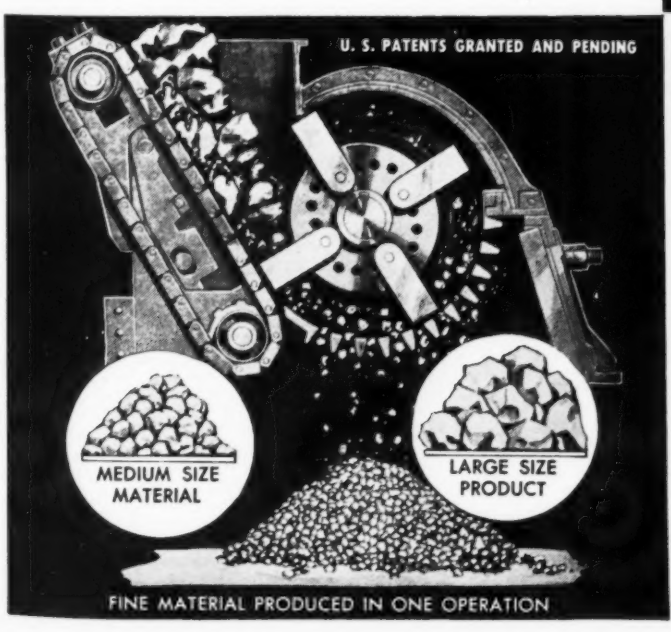
Q. *What single difficulty is the one most often encountered in crushing operations?*

A. "Traffic jams" frequently result through inability of the average hammermill of conventional design to resist clogging in the handling of wet, clayey, sticky material.

Q. *Is the Dixie Continously Moving Breaker Plate an exclusive Dixie feature?*

A. Yes . . . covered by U. S. Patents Granted and Pending.

Right! The Dixie Non-clog Continuously Moving Breaker Plate is the distinguishing characteristic of the famous Dixie Hammermill. Its time and money-saving features have practically revolutionized the reduction of raw materials in hundreds of installations all over the world. This singular record of accomplishment, proved in actual case histories, is your positive assurance that you *can do it better with a Dixie.*



Remember . . . there's only one Dixie. Don't be satisfied with anything less. For details request a copy of our helpful, informative bulletin, "More Efficient Crushing of Raw Materials."

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Whirl a walnut, tied on a string, against a hard surface. You quickly see the uniform breakage, and small power needs of breaking by *impact.* And that's how New Holland Double Impeller Breakers give you profitable stone reduction. Learn more about these bigger profits made possible by New Holland Dual Impact action. Ask your New Holland Distributor to show you "The New Stone Age" —a full color movie demonstrating the construction and operation of New Holland Double Impeller Breakers. Or, send a postcard today for the new, illustrated catalog.

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Forecast for the Farmer

(Continued from page 126)

DR. C. E. BREHM, acting president, The University of Tennessee, Knoxville, Tenn., gave an address based on the premise that the economic tide of this nation ebbs or flows as a direct result of the prosperity of the nation's agriculture. As introductory remarks he praised the two speakers earlier in the program who had stressed the need for proper land care; re-emphasizing the fact that we as a nation must give more attention to land use and rehabilitation.

Dr. Brehm mentioned the fact that a good deal of the agricultural plant in the United States was over-producing, as a result of excessive demands caused by the war, and that unless some means of absorbing this production was found, we were faced with a form of depression. His suggestion was to lower taxes, increase employment and therefore consumption.

U.S.D.A. Farm Program for 1948

CHARLES F. BRANNAN, assistant secretary of agriculture, U. S. Department of Agriculture, Washington, D. C., gave an address before the general luncheon of the Agricultural Limestone Division, titled: U.S.D.A.'s Long-Range Farm Program. In introducing his remarks Mr. Brannan described the department's manner of arriving at an estimate of national needs for the year 1948.

Pointing out that the total U. S. annual consumption of agricultural limestone should be close to 55 million tons, Mr. Brannan gave the following figures for comparison: 1935 to 1939, average annual consumption of agricultural limestone: 6½ million tons; 1946, 28 million tons. He continued by saying that soil conservation, in addition to aiding the farmer economically, is needed to preserve our land.

Mr. Brannan spoke of the big market for phosphate and agricultural limestone needed to return excess intensive crop-class land to cover crop or pasture land; particularly in view of the fact that the public is demanding more meat as food as a result of higher incomes during the war years.

Hunger Signs

First on the afternoon program was a 20-min. color sound movie produced by The National Fertilizer Association titled, "Hunger Signs," showing the indications that result from lack of minerals in plant and animal life, with a running commentary describing the particular deficiency apparent in each scene. Robert H. Engle, agronomist of the association showing the picture, was called upon to explain in detail how the picture was made and the approximate expense entailed.

Showing of the picture and detailed explanation by Mr. Engle was used as a basis for an open forum by the members of the Agricultural Limestone Division concerning a possible picture or pictures of their own.

Labor Relations

(Continued from page 83)

Procrustean bed of judicial precedent. The dictates of the 14th Amendment that 'the means selected shall have a real and substantial relation to the object sought to be obtained,' must be viewed in the light of contemporary conditions under which the legislature has seen fit to enact the statute in question."

At this point the judge gave a historical resumé of the long struggle for the rights of labor, from the days of English common law to the passage of the Taft-Hartley Act by the Congress of the United States. This Act, in the opinion of the court, was in response to a finding by the Congress that both labor and management were guilty of acts in relation to each other which necessitated mutual regulation in the public interest. He quoted Section 13 of the Taft-Hartley Act which specifically provides that: "Nothing in the Act shall be construed as authorizing the execution or application of agreements requiring membership in a labor organization as a condition of employment in any state or territory in which such execution or application is prohibited by law." The judge referred to the discussion of this provision in congressional committees as evidence that it was designed to take care of such state laws as the one in question.

Law Not Discriminatory

The defendants' contention that this law and the state statute forbidding conspiracies in restraint of trade violated the federal and state constitutions because they constituted class legislation and discriminated against them, so as to deny them equal protection, as guaranteed in the constitutions, was met by the judge in part as follows: "The only question raised by the plea of discrimination is whether the statute applies alike to all employers and to all employes * * *," since he had already pointed out that the nature of employer-employe relationship has long been recognized as constitutional justification for legislation applicable only to persons in that relative status.

"Any legislation in the exercise of the police power must perforce affect in different degrees persons or groups of persons within its orbit who occupy different economic, social or political positions with reference to the ends sought by the legislation. Thus Chapter 328 [this law] may enable a non-union workman to obtain a 'free ride' by receiving benefits attained through the expense and efforts of union workmen, but neither this nor other illustrations which might be given of the variable incidences of the statute upon persons differently circumstanced can render the Act discriminatory. * * *

No Abridgement of Free Speech

"We can see no merit in the appellants' [defendants'] proposition that

(Continued on page 130)

HELTZEL BINS

When you think of bins you think of Heltzel Bins. That's natural because your experience and the testimony of all bin users have proved that Heltzel's concentrated engineering in concrete equipment has brought about practical developments that pay off in durability, versatility and trouble-free operation. We're proud of the demand for Heltzel bins and batchers and we're sorry we can't ship orders at a normal rate. We're doing the best material supply will permit. We know you want the best and will be patient and make your old equipment do until you can install a Heltzel.

Heltzel BUILDS IT BETTER

- BINS, Portable and Stationary
- CEMENT BINS, Portable and Stationary
- CENTRAL MIXING PLANTS
- BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)
- ROAD FORMS (with lip curb and integral curb attachments)
- CURB FORMS
- CURB AND GUTTER FORMS
- SIDEWALK FORMS
- CONCRETE BUCKETS
- TOOL BOXES
- FINISHING TOOLS FOR CONCRETE ROADS

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Labor Relations

(Continued from page 129)

Chapter 328 violates the 14th Amendment by abridging the rights of free speech and assembly guaranteed by the 1st Amendment. That argument has been used successfully against a certain type of legislation restricting union activity [reference here to a U. S. Supreme Court decision with respect to a state statute requiring procurement of an organization card as a prerequisite to the solicitation of workmen to join a union]. However, Chapter 328 bears no resemblance to that type of statute. On the contrary, it seems to us that Chapter 328 may serve to secure the rights of free speech and assembly to all persons concerned. The statute protects the rights of workmen to organize; it further protects the rights of workmen to express their individual opinions by refusing to join unions. The right of either side, or any faction of any side, to a labor controversy to assemble and publicize its own ideas remains inviolate." * * *

"Regardless of how salutary the net result of a closed-shop agreement may be, it seems patent to us that the freedom of discussion and dissemination of ideas by all concerned in labor disputes are more restricted by such agreements than by a statute which stresses individual initiative and liberties by prohibiting the use of union membership or the absence thereof as a condition of employment. The General Assembly of North Carolina has attempted to draw upon the residual powers of the state in an effort to remedy a situation of economic instability which has alarmed the thinking people throughout the country."

Inconsistency of Defense

"State laws similar to Section (4) which outlaws 'yellow dog contracts' were first ruled to be unconstitutional, but are now regarded as valid. The appellants have not questioned the constitutionality of Section (4). They contend on the contrary, that such a provision outlawing contracts requiring abstinence from union membership should be held constitutional and that a contrary result should be reached respecting the corollary provisions of Sections (2), (3) and (5) prohibiting union membership from being made a requisite of employment. We cannot accept this view. In either instance the state is merely delineating the area within which two factions with largely conflicting aims may wage their disputes without transgressing the public welfare. If the state may say to the employer, 'You cannot deny work to anyone because of his membership in a union,' we think it follows, *a fortiori*, that the state may say to the parties, 'You cannot deny work to anyone because he is not a member of a union.'"

* * *

"The rights of property guaranteed by our Constitution are necessarily relative to those held by others under the same Constitutional sanctions. The right of contract, whether considered as natural or merely civil, is a property right; certainly of no greater dignity than the right to work, ordinarily regarded as inalienable; and it cannot be unrestrictedly used to the injury of another. Under such circumstances the exercise of the state's police power in its regulation is not a violation of the Due Process required by the 14th Amendment. We cannot find that the legislature exceeded its powers. * * * We cannot say that the matter was not a proper subject of governmental regulation or that the government has become so ensnarled in its own charter as to be forced to admit its impotency."

Barge Loading of Fluorspar

FLUORSPAR DIVISION, Inland Steel Co., plans to install a barge loading dock at its Rosiclare, Ill., plant. The new dock will be on the Kentucky bank of the Ohio river, and will include conveyors for loading ore that will come from the Keystone mill near Salem, Ky.

Purchase Flotation Mill

WILLIS CRIDER AND WILLIAM HOWARD CRIDER, Mexico, Ky., have purchased the flotation mill at Summers fluorspar mine near Marion, Ky., from Robert J. Forester.

FOR ALL DIG-AND-HAUL WORK!

Sauerman Cableway pictured above is digging gravel from bar in river and hauling to top of screening plant in one operation. Handles 700 cu. yd. a day at cost of few cents a yard.

CUT TIME IN HALF with Sauerman

This picture shows a small Sauerman Scraper handling large stockpile silica at processing plant. Scraper stocks out material from washery and reclaims at regular intervals from stockpile to dryer.

Long Range Material Handling Machines

Write for catalog and describe your handling problems.

Gravel excavation and the stockpiling of all kinds of bulk materials are handled at lowest cost with Sauerman Slackline Cableways and Power Scrapers. They dig in dry or sticky ground or under water. Span a wide area and move material from point to point anywhere within the area. Remarkably low power and maintenance costs. Sizes for large or small projects. Gasoline, electric or Diesel.

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Taft-Hartley Bill

(Continued from page 118)

Mr. Gall said that the Act is not in any particular destructive of labor's basic rights. It does, for the first time in federal legislation, distinguish between labor and labor unions, and it does restrict unions and their agents in the exercise of some privileges which they had previously enjoyed at the expense of the individual employe, and, in some instances, the public. The bill was not hastily drafted, he said, but grew out of the experience of 12 years under the Wagner Act and its often biased administration. Congress considered the Taft-Hartley bill for over five months. Mr. Gall called attention to the well-known action by the International Typographical Union in opposing the Taft-Hartley Act as an example of unions attempts to thwart the purpose of Congress. Noncompliance of some unions with the filing requirements of the law, he said, has led to a series of decisions by which these unions were stripped of many of their privileges. In three cases the board dismissed union petitions for elections because the unions involved had not filed the required statements nor indicated any intention of doing so. These statements required in the Act cover financial reports and affidavits that the officers were not members of the Communist party.

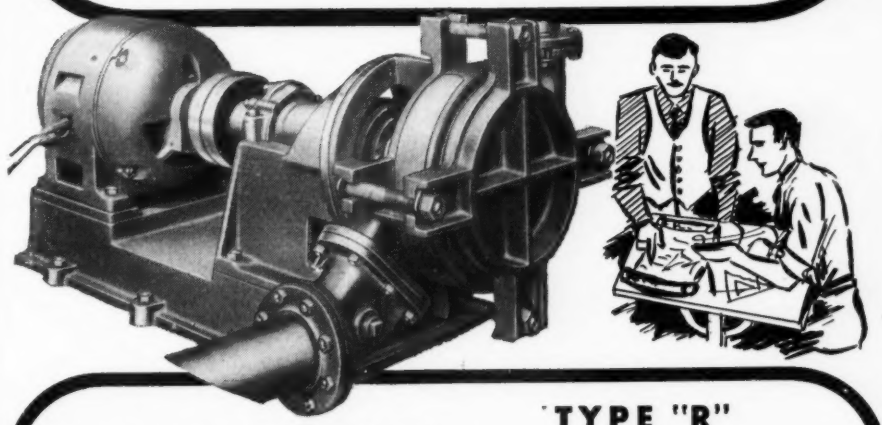
Mr. Gall discussed the question as to what policy a company should adopt if at the expiration of a contract the certified union is barred from an election and from the possibility of a new certification on account of non-compliance with the law. "It appears," he said, "that in such circumstances the employer has the legal right either to refuse to have anything to do with the union or voluntarily to sign a contract in the absence of board certification. Determination of which of these roads to take naturally will depend upon the circumstances of the particular company and upon the power and aggressiveness of the recalcitrant union. If the employer refuses to continue bargaining relations, he faces the danger of a strike. If he decides to sign a voluntary contract, he is in peril of being charged with an unfair labor practice if that contract requires him to do something — maintain a closed shop, for instance—that is contrary to the law. Furthermore, he loses certain benefits which flow from contracting with a certified union."

Wage-Hour Law and Portal-to-Portal Act

REUBEN S. HASLAM, associate counsel, National Association of Manufacturers, followed Mr. Gall on the program with an excellent review of "Significant Developments Under the Wage-Hour Law and the Portal-to-Portal Act of 1947." He brought up to date the application of the Wage-Hour Law since its passage in 1938,

(Continued on page 132)

Men in YOUR field helped us build it



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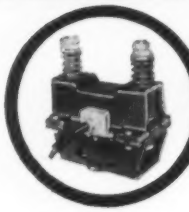
MORRIS *Centrifugal Pumps*

SYNTRON
"Pulsating Magnet"

ELECTRIC VIBRATORS

With Variable Controlled Power



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Type "MR" 42"x96" Double Deck

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RACINE — WISCONSIN

Wage-Hour Law

(Continued from page 131)

and its evolution from what at first was expected to cover solely interstate business until it has been broadly interpreted today to include almost any business.

Mr. Haslam said that whenever a new concept of Wage-Hour Law coverage was developed it carried with it serious penalties. Employes were granted the retroactive "right" to recover double any under-payments, plus costs and attorneys' fees. The only restraints were state statutes of limitations. In 1947, the Supreme Court had ruled that employes who repaired electric motors which did not thereafter enter channels of commerce were engaged in producing goods for interstate commerce because some of the motors might be used by others to produce goods. As an example of this liberal interpretation as applied to the industry, where a retail yard is operated and the products are sold to builders and other commercial users, the employes at the yard might be treated as covered by the Act.

The Administrator and the lower courts have extended the coverage of the Act even farther than the Supreme Court, said Mr. Haslam. The Wage-Hour Administrator has ruled: (1) that employes who produce sand, gravel or crushed stone which is dumped on a facility of commerce are engaged in "interstate commerce"; (2) that local producers of fertilizer and agricultural limestone are covered by the Act "because the fertilizer helps crops grow, and those crops might later become a part of ingredient of some item crossing state lines."

Mr. Haslam said that the question of what constitutes overtime wages has resulted in much confusion. At present no employer may safely pay a bonus to his employes unless he includes it in their regular rates and recalculates the overtime. Neither can an employer safely pay daily overtime to his employes who regularly work more hours each day than the daily work schedule for which straight-time wages are payable. Such overtime must be treated as straight time and overtime paid on overtime.

Referring to the so-called Portal-to-Portal Act of 1947, Mr. Haslam outlined how this law was designed to eliminate the potential liabilities under the Wage-Hour Law brought about by court decisions which opened up possibilities of an avalanche of suits. The 1947 Act served to wipe out walking time and other portal-to-portal claims which may have accrued before May 14, 1947 which were not based upon a contract, custom or practice in effect at the place of employment. It also invalidated future claims unless they are compensable by contract, custom or agreement. A two-year statute of limitations on claims arising under the Wage-Hour Law, the Walsh-Healey Act, and the Davis-Bacon Act also was included in the 1947 Portal-to-Portal Act.

Manufacturers' News

Falk Corp., Milwaukee, Wis., has promoted Harry Green to the position of consultant on machine shop operations, and Carl Senn to consultant on methods engineering. B. C. Bugbee, formerly production control manager, has been named machine shop superintendent, while Robert Fischer has been placed in charge of all standards throughout the plant.

Ebasco International Corp., New York, N. Y., engineers and developers of foreign power projects, has elected Kenneth R. MacKinnon as president of the company. He was formerly vice-president.

Caterpillar Tractor Co., Peoria, Ill., has announced the appointment of W. K. Cox, assistant general sales manager, as advertising manager to succeed Gerald M. Walker who has retired after 33 years of service with the company. J. J. Valentine, central

W. K. Cox

J. J. Valentine

division sales manager, will succeed Mr. Cox as assistant general sales manager, and Ferd D. Haberkorn, sales training division manager, will assume Mr. Valentine's position. J. W. Mohler, assistant central division sales manager, has been named to replace Mr. Haberkorn, and Herman S. Eberling, Western division district representative, has been appointed to succeed Mr. Mohler.

Air Reduction Sales Co., New York, N. Y., has announced that Charles S. Munson has been elected chairman of the executive committee. He will be succeeded as president by John A. Hill, formerly vice-president. William C. Keeley, vice-president, has been named chairman of the finance committee. C. E. Adams remains chairman of the board of directors. Dr. G. V. Slottman, formerly manager of technical sales division, has been appointed technical assistant to the vice-president. Scott D. Baumer, formerly assistant manager of the division, has been named manager and Edward H. Roper, assistant manager.

American Brake Shoe Co., New York, N. Y., announces that J. Robert Pauline has been appointed works manager for the Kellogg division, with headquarters in Rochester, N. Y. He was formerly assistant to the vice-president in charge of operations and engineering. John A. Fellows has been named assistant chief metallurgist at the Research Center in Mahwah, N. J. The Kellogg Division further an-

Get ready for Spring production with a SECO!...Is your order in?

The picture above shows the flow of Seco Vibrating Screens to producers for Spring production. Since moving into our new factory, we've tripled production. Now, we are making prompt deliveries on single, double, triple, three and one-half deck Seco models. No more long waits.

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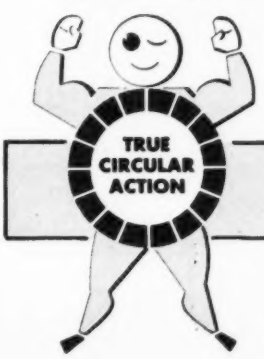
OVER 250 MODELS! — There's a right Seco for screening every type of material from sand to rip rap. Write, wire (Dept. M) or phone your requirements today for prompt delivery. Our Buffalo phone number is Taylor 0455.



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PRODUCERS OF VIBRATING SCREENS EXCLUSIVELY
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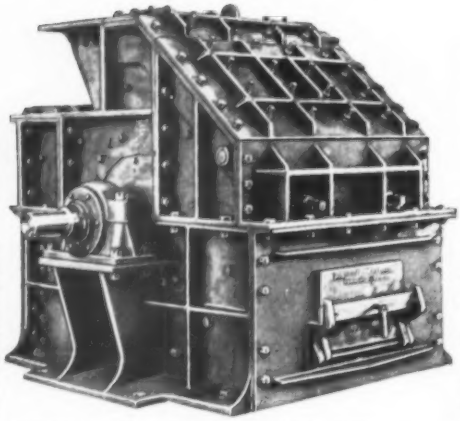
The New AMERICAN "ACS" Offers a Great Advance in Heavy Duty Crushing...



American ACS features sturdy sectional construction, dust-tight machined joints. All crushing parts of extra heavy manganese steel.

American ACS Crushers are built for high capacity, heavy duty production with individual size control assuring a uniform run of desired sizes from roadstone coarseness to agstone fineness in the same run with accurately governed ratios. Center feed for high ratio of fines and front feed for minimum fines. Capacities up to 250 TPH.

Typical screen analysis for limestone produced by ACS crusher using 2½" grate bar openings:

- 4.4% passing 2½" screen retained on 1½" screen.
- 13.2% passing 1½" screen retained on 1 " screen.
- 18.7% passing 1 " screen retained on ¾" screen.
- 19.8% passing ¾" screen retained on ½" screen.
- 16.5% passing ½" screen retained on ¼" screen.
- 13.2% passing ¼" screen retained on ⅛" screen.
- 14.2% passing ⅛" screen.

Send for new booklet: "Better Stone Crushing"

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Originators and Manufacturers of Ring Crushers and Pulverizers

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Trainloads of cast iron, bar steel, sheet steel and drop forgings; thousands of Timken roller bearings, magnetos, carburetors, fuel pumps and many other parts and materials . . . including 20,000 gallons of gasoline per month simply for factory test runs . . . that's what it takes to build Wisconsin Heavy-Duty Air-Cooled Engines!

But above all this *quantity* is the *quality* that is the final product . . . the Heavy-Duty Air-Cooled Wisconsin Engines that are serving Industry so dependably, in so many ways . . . as integral power units on a great variety of equipment, delivering "Most Hp. Hours" of on-the-job power service.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

nounces that firm prices will be established on all products, discontinuing the former policy of "price in effect at time of shipment" followed since the war.

Robins Conveyors Division, Hewitt-Robins, Inc., Passaic, N. J., has appointed The Galigher Co., Salt Lake City, Utah, as representative in territory covered by Utah, parts of Idaho, Montana, Nevada and Wyoming. A new sales office has been opened in Kansas City, Mo., headed by C. Boyd Goodhart.

Hewitt Rubber Division, Hewitt-Robins, Inc., Buffalo, N. Y., has announced the appointment of Monarch Electrical Co. of LaSalle, Ill., as distributor serving local industry within a radius of 75 miles, principally in Peru, LaSalle, Ottawa, Mendota and Streator.

Jaeger Machine Co., Columbus, Ohio, has moved its Eastern regional offices, formerly in New York, to 1504 Widener Building, Philadelphia, Penn. L. T. Phillips is manager at the new office.

Link-Belt Co., Chicago, Ill., has announced the removal of the Pittsburgh district sales office to 5020 Centre Ave. Otto W. Werner heads the office as district sales manager. Frank C. Thompson, purchasing agent for Indianapolis plants since 1919, has retired under the company's retirement plan, and Richard J. Joyce will succeed him as purchasing agent with headquarters at the Ewart, Ind., plant.

Lima Shovel & Crane Division of the Lima-Hamilton Corp., Lima, Ohio, announces the appointment of J. T. Conners of Cleveland, Ohio, as agent for northeastern Ohio. G. L. Frazee is associated with Mr. Conners as a salesman for the Conners Equipment Co., which was formed by Mr. Conners in 1946.

Bemis Bro. Bag Co., St. Louis, Mo., has announced that Bradford R. Stetson, superintendent of the Minneapolis bag factory since 1937, has been appointed office assistant in the general production department in St. Louis, Mo.

International Harvester Co., Chicago, Ill., has opened a sales and service branch at 2855 Cypress St., Oakland, Calif.

Stearns Magnetic Mfg. Co., Milwaukee, Wis., announces the appointment of Herbert L. Piasecki, office manager, to the position of assistant treasurer. A. B. Paape has been made assistant secretary.

Dow Chemical Co., Midland, Mich., has released its trademark rights to the name "saran" which applies to a series of thermoplastic resins.

Mack Trucks, Inc., New York, N. Y., announces that C. W. Haseltine, vice-president, secretary and treasurer, has retired after 35 years of service with the company. Announcement has also been made that F. W. Sommer has been appointed treasurer, and T. C. Homan, secretary.

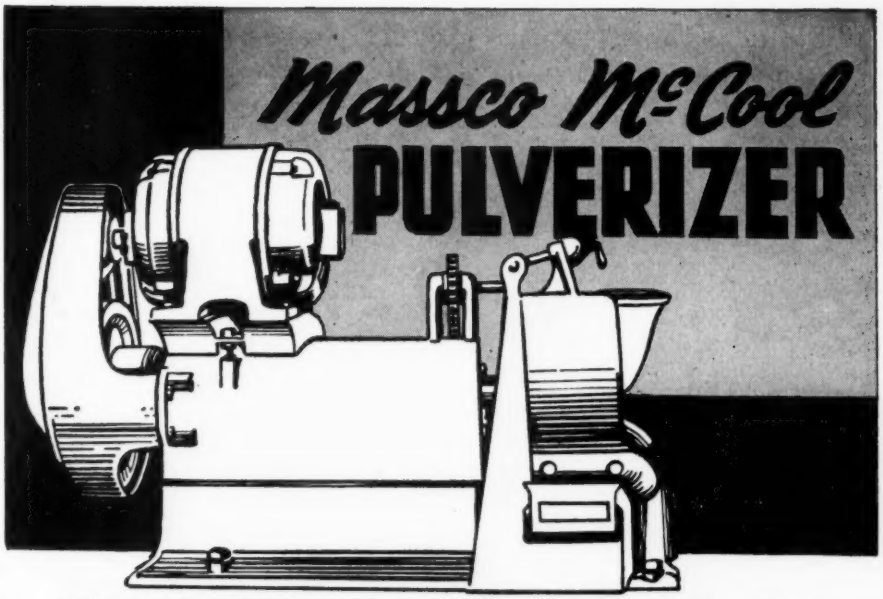
St. Regis Paper Co., New York, N. Y., announces the appointment of

Arch Carswell as general sales manager of the Multiwall Bag Division. Mr. Carswell, who joined the company in 1928, will make his headquarters at the New York office, according to Edward R. Gay, vice-president. H. W. Sloan, previously assistant Pacific Coast manager, succeeds Mr. Carswell as Pacific Coast manager of the division.

Truck-Man, Inc., formerly a division of Yard-Man, Inc., Jackson, Mich., has incorporated as a separate and distinct unit to carry on the manufacturing of the Truck-Man, Model "D" lift truck, and the Truck-Man utility platform truck. Yard-Man, Inc., continues as manufacturers of lawn mowers exclusively. Officers of Truck-Man, Inc., are T. B. Funk, president; W. S. Butterfield, secretary and treasurer; and Walter Mayer, general manager.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that James M. White has resigned as vice-president in charge of manufacturing, but will remain in an advisory capacity. Manufacturing operations will continue under the direction of Fred S. Mackey, general works manager in charge of all general machinery plants, and Hugo W. Liebert, general works manager in charge of all tractor plants.

Timken Roller Bearing Co., Canton, Ohio, announces the retirement of William A. Fowler, general manager of the Columbus plant, and the appointment of L. D. Gable as general manager to succeed Mr. Fowler.



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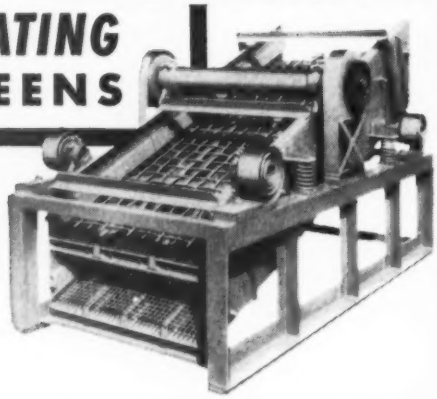

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Write to Screening Machinery Division for Bulletin S-4.

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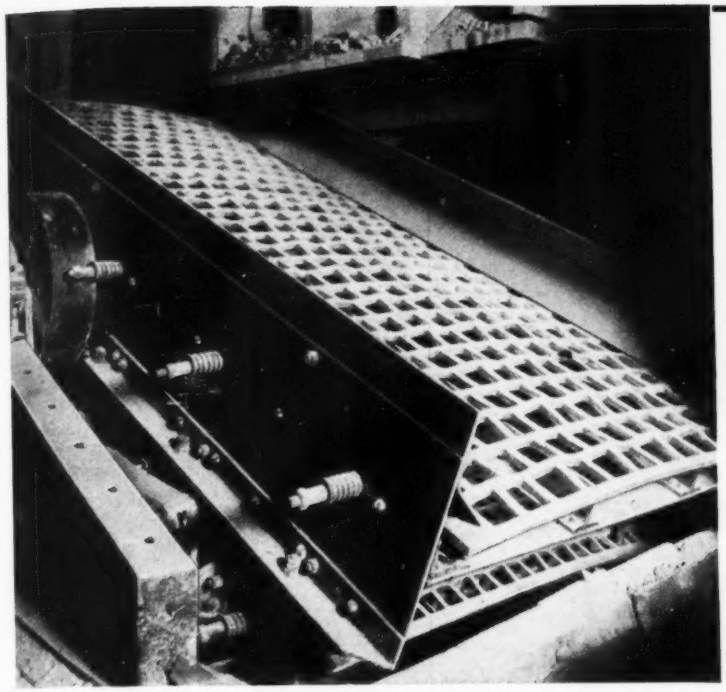

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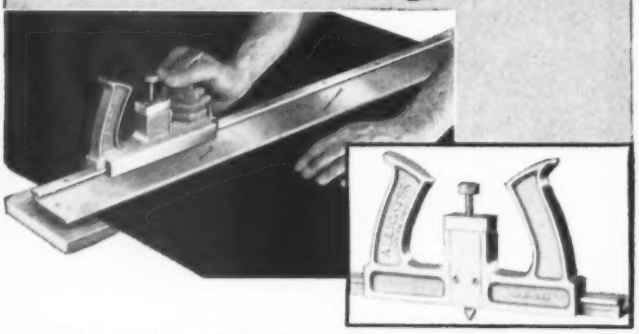

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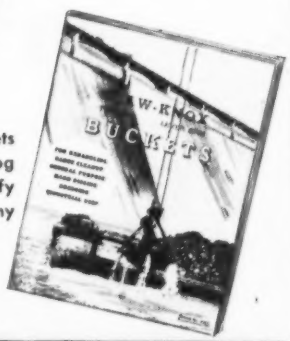

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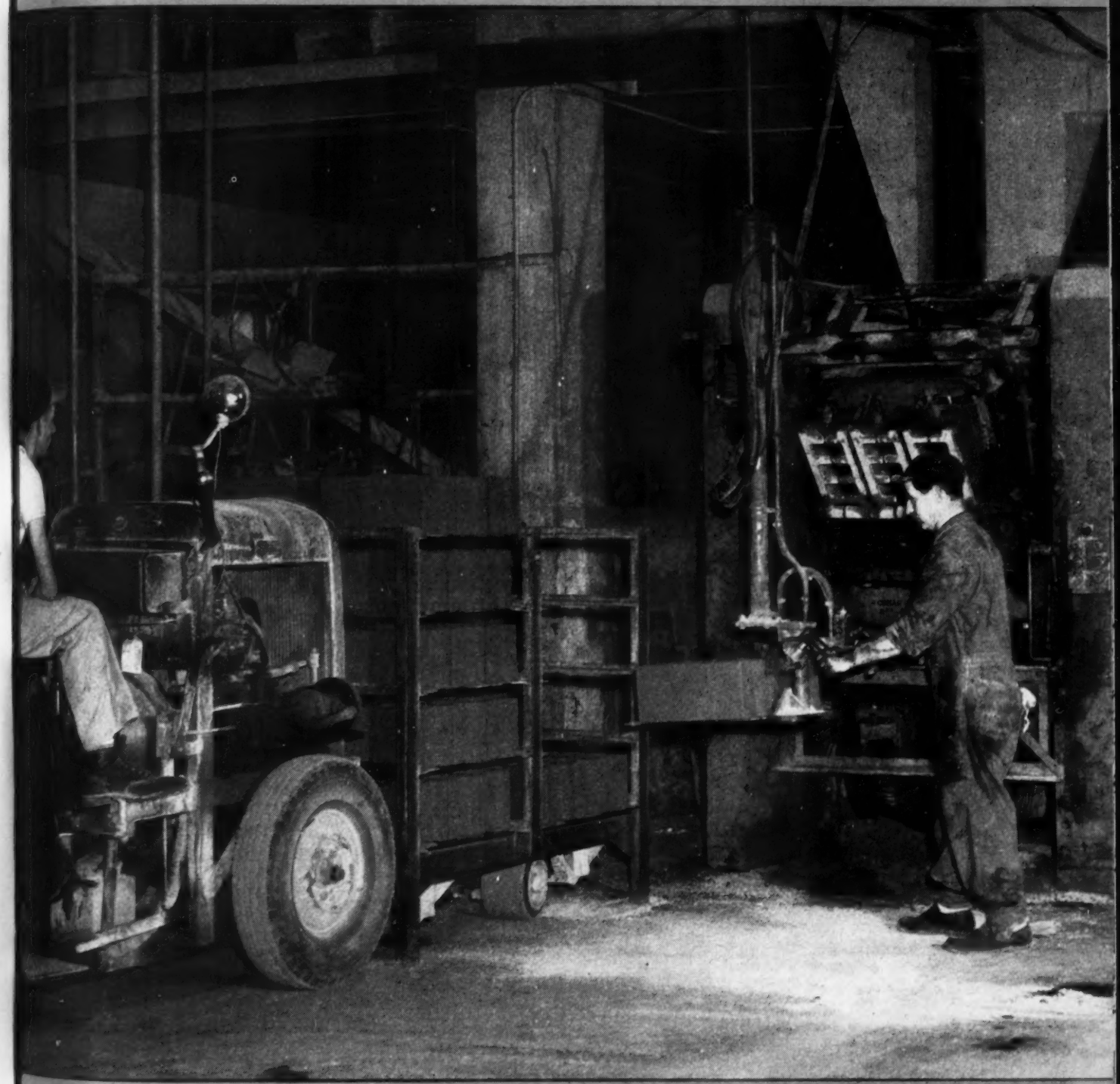

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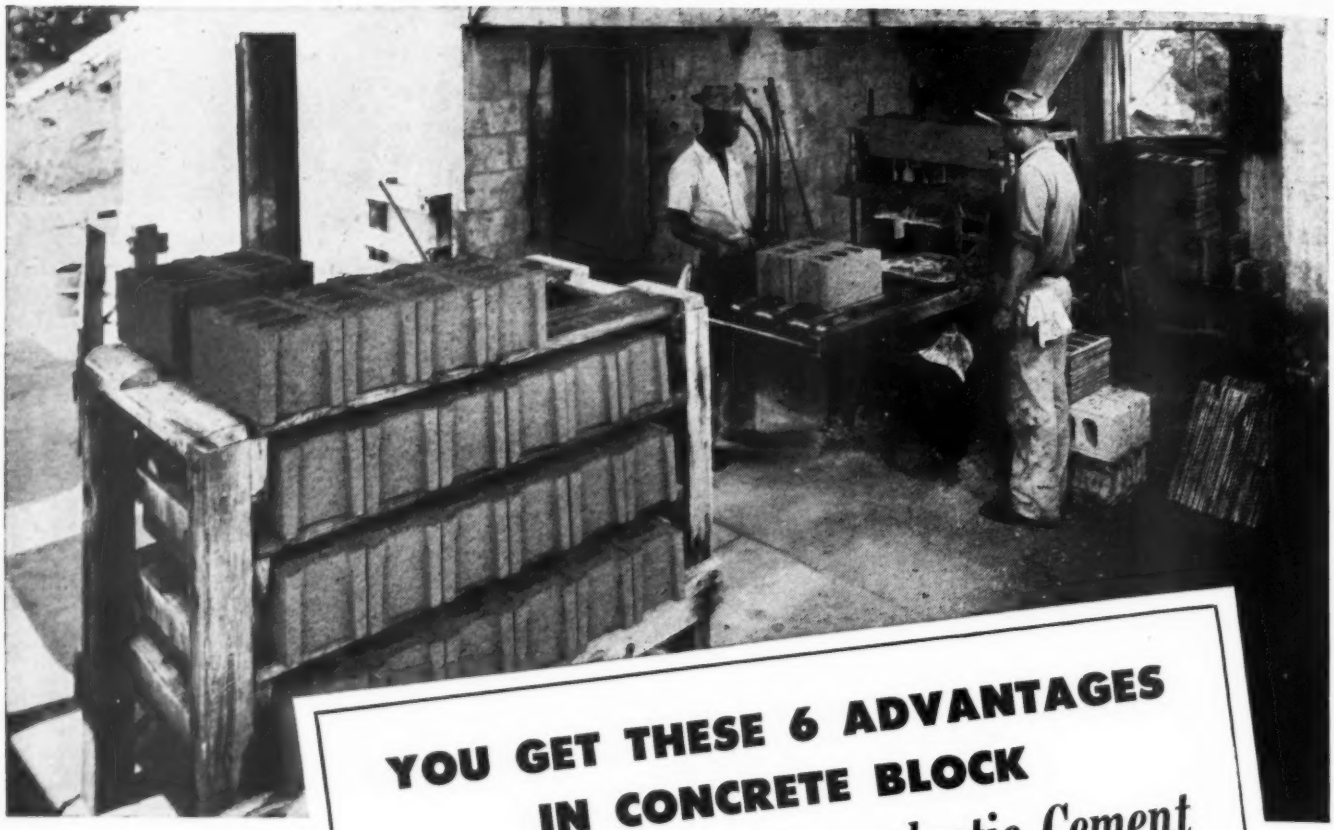
A SECTION OF ROCK PRODUCTS



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4. **Less breakage** and less cracking in handling from machines to racks to kilns; fewer culls and throw-backs.
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Atlas Duraplastic complies with ASTM and Federal specifications and sells at the same price as regular cement. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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AIR-ENTRAINING PORTLAND CEMENT

MAKES SUPERIOR CONCRETE PRODUCTS AT NO EXTRA COST

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel—Sunday Evenings—ABC Network*

INDUSTRY NEWS

Seeks Dock Lease For Block Plant

JOHN ROSS, Ashland, Wis., recently sent a proposal to the city council that the Mowatt dock site, just west of the Soo ore dock, be leased to him for the purpose of erecting a concrete block plant on the site, stating that he in turn will put the dock into shape. A city dock has long been a demand of the residents of Ashland. Mr. Ross, twenty years a sailor on the Great Lakes, also plans to ship sand and gravel.

Booklet on Modular Concrete Building Units

BESSER MANUFACTURING CO., Alpena, Mich., has published a new booklet illustrating concrete building units having modular dimensions, now available from Besser equipped plants throughout the United States and many foreign countries. In addition to fifty Modular Standard Units, the booklet describes bull nose units, beam lintel block, chimney block, and floor filler units.

Block Manufacturers Elect Officers

COLUMBUS CONCRETE BLOCK MANUFACTURERS ASSOCIATION, Columbus, Ohio, recently installed the following new officers: John M. Swickard, Swickard and Crissman, president; Carl K. Dale, Al C. Dale and Son, vice-president; and John F. Royer, who continues as secretary-treasurer. Robert G. Kern, Columbus Builders Supply, Inc., is the retiring president.

Admitted to Membership in A.C.P.A.

FOLTZ CONCRETE PIPE WORKS, Lexington, N. C.; Schmidt Concrete Products, Inc., St. Joseph, Mo.; and Lanna Construction Co., Ltd., Czechoslovakia, have been admitted to membership in the American Concrete Pipe Association, Howard F. Peckworth, managing director, has announced.

Presented Gift

H. X. ESCHENBRENNER, president, Universal Concrete Pipe Co., Columbus, Ohio, was recently presented with a diamond ring by employes of the company's plants in 14 cities and eight states.

Elected President

HARRY F. THOMSON has been elected president of the General Material Co., St. Louis, Mo., succeeding the late A. C. Butterworth who died in November, 1947. Mr. Thomson has been vice-president of the company since 1927. He recently completed a three-year term as a national director of the American Society of Civil Engineers. He is a past president of the National Ready Mixed Concrete Association, and is at present serving as a director of the American Concrete Institute.

Cement Production

PORTLAND CEMENT production in October, 1947, as reported to the Bureau of Mines, was 18,300,000 bbls., a total of 12 per cent greater than that reported for October, 1946, and representing the largest single month's production by the portland cement industry. Mill shipments reached 20,562,000 bbls., a figure 16 per cent above that reported for October, 1946. This record output still did not meet demands, however, and stocks continued to decline, standing at 5,659,000 bbls. on October 31, a decrease of 22 per cent below that reported for October, 1946.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of October, 1947, and October, 1946.

RATIO (PER CENT OF PRODUCTION) TO CAPACITY

	Oct. 1947	Oct. 1946	Sept. 1947	Aug. 1947	July 1947
The month	90.0	81.0	88.0	86.0	80.0
12 months	77.0	64.0	76.0	75.0	75.0

88th Year in Business

JOHN A. MOSS, president of John A. Denie's Sons Co., Memphis, Tenn., distributed the annual bonuses to employes at a party celebrating the company's 88th year in business. The following officers and directors for 1948 were announced: John A. Moss, president; Stanley White, vice-president and general manager; Forrest Ladd, vice-president and sales manager; Henry Jommer, vice-president of all operations; Byron Bartholomew, secretary-treasurer; Joe Gee, assistant vice-president of contract sales; and Karl Pommer, assistant vice-president. Directors are John A. Moss, chairman; Stanley White; Byron Bartholomew; R. G. Clarke, and J. A. Fleetwood.

Company Contribution to Employes' Pension Fund

MATERIAL SERVICE CORP., Chicago, Ill., recently added approximately $100,000 as an annual contribution to its salaried employes' pension fund. This profit sharing plan, started in 1945, is unique in that the maximum allowable 15 per cent of employes' annual salary is contributed in its entirety by the corporation.

Elected Vice-President

SIDNEY J. MARKS has been elected vice-president of the Material Service Corp., Chicago, Ill., and admitted to the company's Quarter Century Club.

BUFFALO BLOCK CO., Man, W. Va., has been granted articles of incorporation. An authorized capitalization of $25,000 and $10,000 was listed, and Mary E. Crum, C. E. Conner and Mae C. Strollings were named principals.

•

OSCAR BROGAN has started construction of a concrete block building in Pleasanton, Kan., to house the Jones Concrete Block Co.

•

READING CONCRETE PRODUCTS, INC., Reading, Ohio, formerly conducted as a partnership under the name of Concrete Products and Supply Co., has been incorporated with a capital of 250 shares, no par value stock. The incorporators are Richard E. Francis, Walter Schmitt and Margaret Donelan.

•

A. L. BARKER has sold his interest in the Bilt-Rite Block Co. and the B. C. Builders, Baker, Ore., to W. O. Beeson, superintendent for B. C. Builders.

•

AMERICAN CONCRETE BLOCK CO., Shreveport, La., recently completed one year of operation. The company manufactures cinder block in all sizes including bull nose and round corners, which are certified by Underwriters' Laboratories, Inc. E. A. Hamner and sons, Foster and E. A., Jr., own and operate the business.

•

HAROLD SISHC has purchased the gravel pit, cement block, ready-mix concrete and traxcavator business in Torrington, Wyo., from W. R. Gillaspie.

•

CANTON CONCRETE PRODUCTS CO., Canton, Ohio, has started production of a new type concrete block, shaped to resemble cut stone. Samuel J. Moss, vice-president, designed the die. Other company officers are J. Lewis Kronsis, president, and Stephen H. Smith, secretary-treasurer.

•

CUMBERLAND SAND AND GRAVEL CO., Rice Lake, Wis., has been organized to deal in concrete and concrete products, sand, gravel, brick and limestone and the construction business. Minimum capital has been listed at $5000, with 50 shares no par value. Edward Sprague, Melvin G. Coon and Margaret Mesang are the incorporators.

•

ROCK HILL CONCRETE CO., Rock Hill, S. C., has been incorporated to manufacture concrete block. Capital stock was listed at $15,000. Sam J. Breen is president.

•

DELTA CONCRETE SUPPLY CO., Harlingen, Texas, will be opened shortly for the manufacture of ready-mixed concrete. Mrs. Jessie K. Liddell and son, Newton S. Liddell, Jr., will own and operate the plant.

•

DEVOS BLOCK CO. plant, Milwaukee, Wis., was damaged by fire recently to the extent of $3500. The fire began near a second floor workbench, and principal loss was to concrete mixing and block pouring machinery.

Here's NEW BEAUTY That Helps Me Sell Concrete!

"Yes, Sir . . . on every trip, the new 1947 Smith-Mobile's handsome appearance helps advertise my business . . . virtually acts as my concrete salesman."

Smith-Mobile's beauty is achieved largely by functional styling. Mixer engine, transmission, water pump, valve system and all moving parts are completely enclosed in a streamlined housing. And these improved Smith-Mobiles are easy to keep handsome . . . easy to "hose off" between trips. The roomy charging chute prevents spilling of dry aggregates or cement. And the perfected drum closing door seals batch in drum . . . keeps concrete from seeping out in transit.

Improved performance goes along with new beauty. Drums are larger, yet overall weight is materially decreased. Dual water injection system prevents freezing in cold weather. Direct-connected motor has 3-point suspension. Simple, lightweight transmission is foolproof. Drum rides on Timken Roller Bearings in rubber-cushioned case.

New 4½ and 5½ yard sizes now available. Smith-Mobiles can now be obtained in 4 popular sizes . . . either truck mixer or agitator. Get the complete Smith-Mobile story — today. Write for Bulletin No. 230.

THE T. L. SMITH COMPANY, 2885 N. 32nd Street, Milwaukee 10, Wisconsin, U. S. A.

New Bulletin Just Off the Press!
Gives you all the facts, dimensions and specifications of the improved SMITH-MOBILE models. If you haven't already received yours, be sure to ask for a copy.

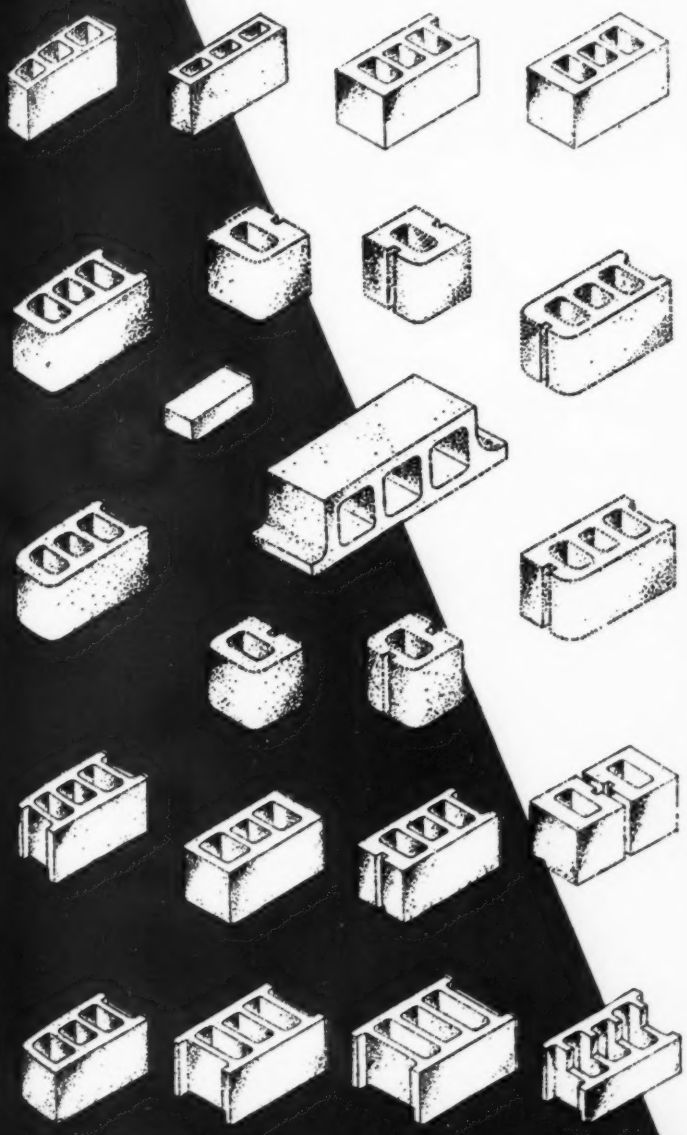
SMITH MOBILE

The Original High Discharge Truck Mixer and Agitator

A 5162-1P-R

Besser Vibrapacs are *Versatile!*

ONE SET of PLAIN PALLETS for ALL SIZES of UNITS



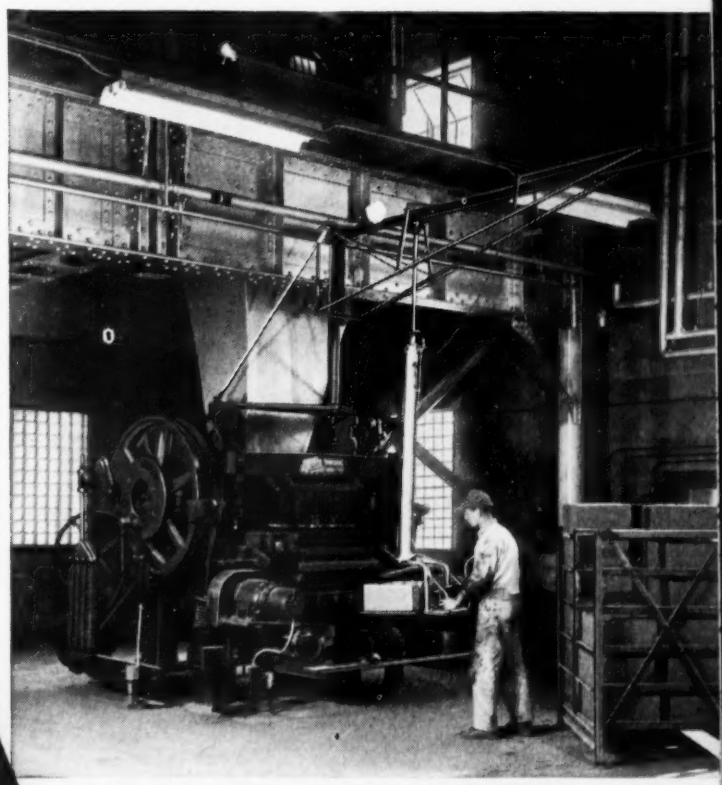
The Besser Super Vibrapac is versatile, flexible, economical and automatic in operation. It produces ALL concrete masonry units on ONE SET of Plain Pallets, regardless of size. Changing of molds to make the various unit sizes requires less than 30 minutes. And this is only one of the time-saving features of the Vibrapac. Undirectional Vibration . . . Plain Pallet . . . Uniform control of density and texture of block . . . Power off-bearing of block . . . and other Besser originally developed features, give you a machine unexcelled in the Concrete Products Industry. Write today for descriptive literature.

BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants

115 48th STREET ALPENA, MICH., U. S. A.

With plain pallets, quick, easy changes can be made to modular dimension block. All new Vibrapacs since 1945 have modular dimension molds for block sizes as adopted by American Standards Association.



The Besser Super Vibrapac is FULLY AUTOMATIC. Capacity 4,800 — 8 x 8 x 16″ units or equivalent per 8-hour day.

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

BESSER PLAIN PALLET VIBRAPACS

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DISCHARGE

PRODUCTION

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REVOLUTIONARY TRUCK MIXER DESIGN

THE RESULT OF 18 YEARS OF TRUCK MIXER MANUFACTURING and 25 YEARS OF CONCRETE MIXING EXPERIENCE

By

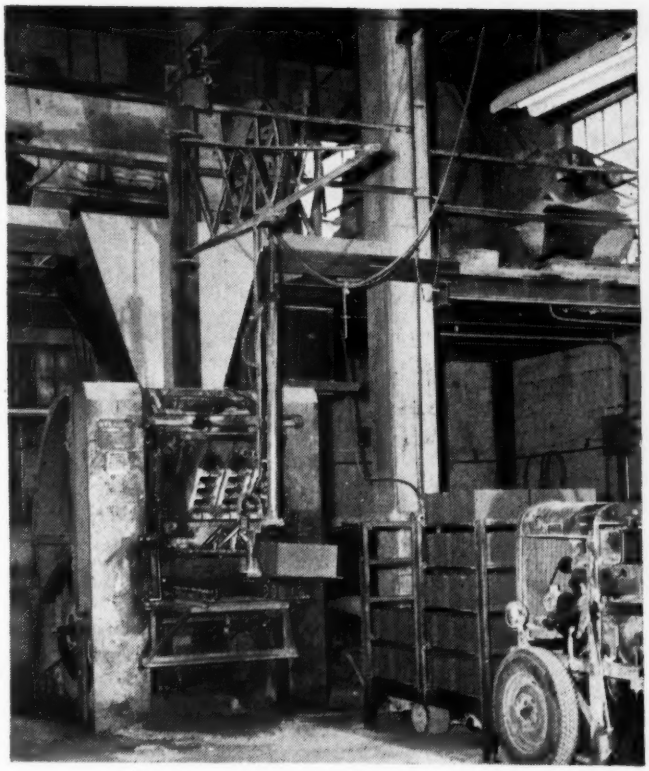
CONCRETE TRANSPORT MIXER CO. INC.

4985 FYLER AVE. ST. LOUIS 9, MO.

Increased Production with New Kilns and Block Machines

Comac Builders' Supply Co., Rochester, N. Y., uses foam glass insulation for curing kilns

By W. B. LENHART



Showing location of mixer on mezzanine platform above block machine

YEARS of experience have been drawn upon by the Comac Builders' Supply Co. of Rochester, N. Y., in the design and construction of its modern concrete masonry plant, recently completed. The company is proud of its quality building blocks manufactured with new equipment and under laboratory control.

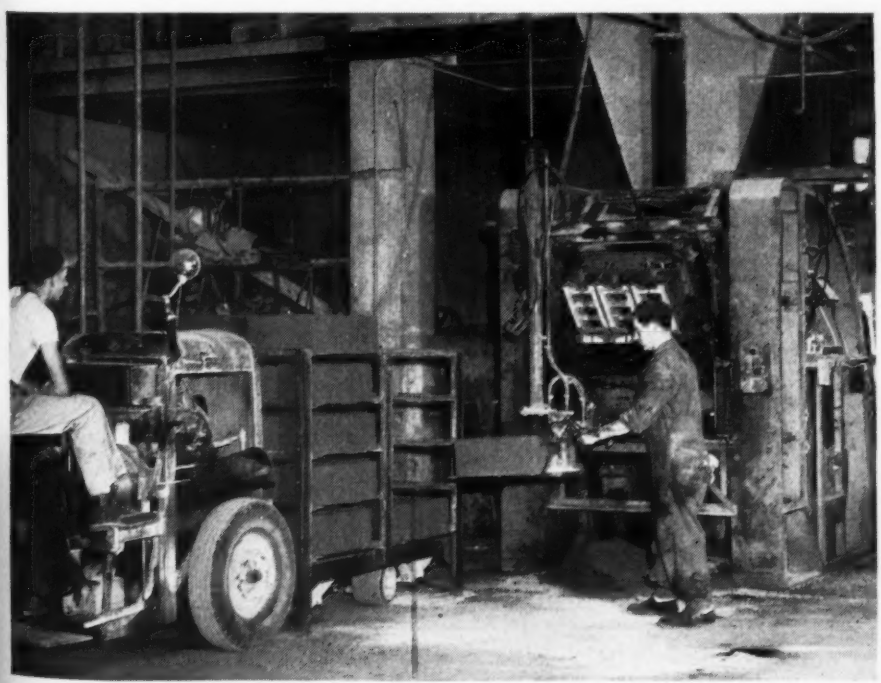
One of the interesting things about this modern plant is that they installed the first of the new Stearns Model "15" block machines about one year ago. As always happens with a radically new model machine, various "bugs" developed. The manner in which the officers of the company, particularly the superintendent, George Hase, cooperated with the manufacturer of the equipment to get the machine into dependable, high speed production, is noteworthy. According to Mr. Hase, they are well into the second million units in production.

One of the outstanding features of the Model "15," is that the rate of production can be altered by simply turning a conveniently located knob. (This can be locked when desired.) The production speed is determined by altering the length of time which the feed drawer remains forward over the vibrating mold box. The most desirable rate will depend on the character of the aggregate being used, the type of unit being made, and the facilities for getting the finished units away from the machine.

The machine manufacturer rates the production at from 4 to 6 cycles per minute, which in terms of 8- x 8- x 16-in. block is from 12 to 18 per minute. The Comac Builders' Supply Co. finds that a rate of a little more than 4 cycles per minute best suits their purpose. At present they are turning out 6500 8-in. block per 9 hour day; including all delays.

Other features of this new machine are: (1) both the mold box and the pressure head vibrate; (2) the feed drawer carries a rotating agitator to quickly break up and super mix the material; and (3) the master cam shaft runs only when it is doing work, thus permitting smooth and effortless operation.

Before similar equipment was offered by the Stearns Manufacturing Co., Superintendent Hase developed an automatic chain conveyor device which takes the plain steel ¾-in. pallets from the curing racks to the pallet magazine at rear of the block machine, cleaning and oiling the pallets as they go. This is a great labor saver.



Moving block on rack from high production block machine to curing room

Curing System

Seven kilns, each 8½- x 65-ft., are operated. Of cinder block construction, two of the kilns have a 6-in. wall and then an insulating layer of foam glass with a 4-in. wall of concrete masonry to enclose the insulating material. This foam glass insulation is carried as a continuous unit over the roof so that each kiln is completely insulated. The method of insulating the kilns is highly favored, as a better block is obtained more efficiently. All the remaining kilns will be similarly insulated.

The plant building, of concrete block construction, has three bins of concrete block construction. The block making up these bins are reinforced with two ¼-in. rods on horizontal

(Continued on page 149)

Storage facilities for volcanic cinders with concrete products plant in the background

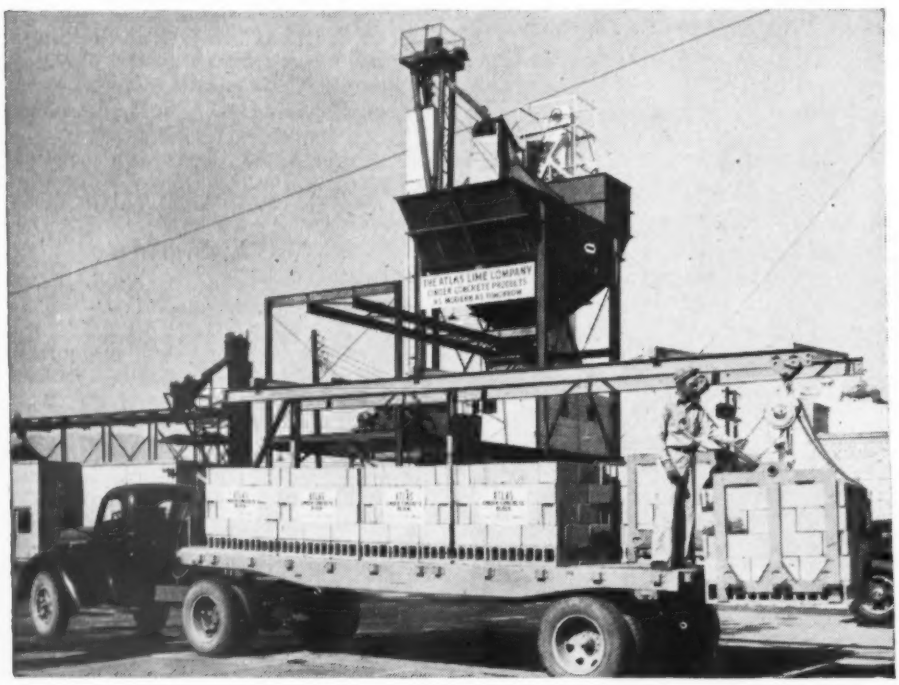
Cut Down Haulage Costs to Job

Atlas Lime Co., El Paso, Texas, uses volcanic cinders as aggregate in manufacturing lightweight block

By S. L. MEYERS

A PLANT making light-weight volcanic cinder units has recently commenced production in El Paso, Texas, near the Mexican border. It was built and is being operated by the Atlas Lime Co., a long established, enterprising concern manufacturing many kinds of lime, stucco and cement paints. Due to their light weight, excellent insulating and sound proofing properties, exact sizing, allowing for trim construction, and pleasing surface texture, these blocks have been received with enthusiasm by contractors, builders, and home owners.

This company is not only a very modern producer of various building materials, but it also employs alert sales and distribution methods. One example is a very interesting and informative pamphlet which describes the salient features of its products for the benefit of the consumer or prospective user of these materials. Some 20 modular sizes of building blocks as well as beam-lintels are manufactured. A new and clever method of transporting blocks to the job that eliminates hand unloading has been developed which will be explained later in this article.



Showing how block may be rapidly unloaded with the aid of overhead track and lowering hoist

The cinders, a natural product, are the result of volcanic activity in southern New Mexico during the comparatively recent Tertiary geological periods. Molten magmas, containing water and other volatile constituents under great pressure, rose to the earth's surface and were ejected more or less violently. The drop in external pressure allowed the dissolved volatile gases to expand and form a vesicular or porous structure during the rapid cooling of the igneous material. This resulted in a vitreous cinder, much of it having a size ranging from 100-mesh to 1-in., usually depositing to form formations of cone-like hills. Due to the dryness of the climate with very little erosion or sedimentary action taking place, no tuff formation occurred, thus leaving this cinder-like material in a loose, easily quarried condition.

The cinders have the following chemical analysis:

Silica	43.56
Alumina	19.60
Ferrous and Ferro oxide	10.34
Lime oxide	10.70
Magnesia	9.60
Sulphur trioxide	Trace
Ignition Loss	1.69
Potash	1.00
Soda	3.38

Concrete test specimens, made from one part cement to four parts cinder aggregate by weight, showed normal volume changes in air-drying, in water, under steam pressure in the autoclave, and in saturated sodium sulphate solution. Furthermore, the alkali-aggregate reaction was not excessive.

For use in concrete, volcanic cinders have some advantages over cinders formed as the residue from the combustion of coal or coke. They do not contain chemically unstable sulphides or soft, unconsumed carbon, and they are more uniform in composition and physical characteristics.

No Sand in Aggregates

Only cement and two sizes of volcanic cinders are needed in the fabrication of these building units. To make up for a deficiency of fines in the natural material as mined, some crushing is resorted to, since the use of natural sand in place of fine cinders would increase the weight of the units and decrease the valuable properties of insulation, nailability, etc.

By means of careful selection of cement content and the most suitable proportions of the two sizes of cinders, combined with the processes of vibration and compaction in the Besser block machine and steam-curing of the units in special rooms, adequate compressive strength is obtained. These units pass all the A.S.T.M. requirements for compressive strength, absorption, and moisture content without exceeding a weight of 26 lb. per 8- x 8- x 16-in. unit. Other properties of these blocks are:

Conductivity, k equals 2.9 (per sq. ft., 1 in. thick, per degree F. for concrete; calculated from a known relation between concrete and weight). Modulus of Elasticity equals 245,000 (includes air space in cores).

Air-drying shrinkage at 7 days equals 0.022 per cent.

Two high production block machines supplied concrete from overhead mixers. Weigh lorry on overhead track moves aggregate from storage bin to mixers

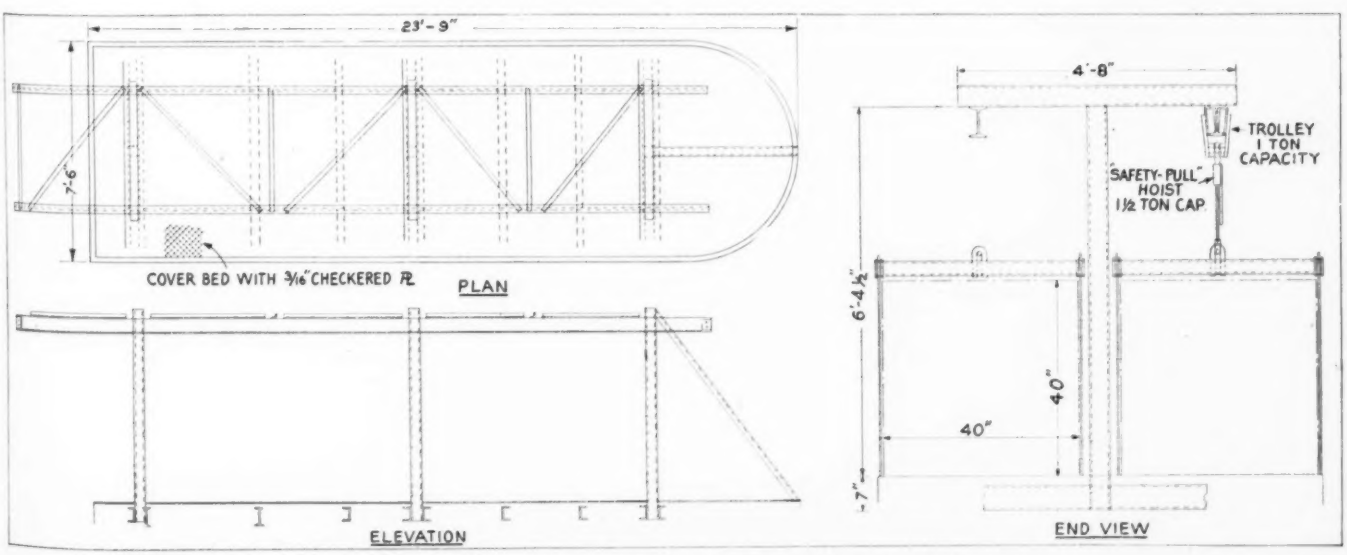
Air-drying shrinkage at 28 days equals 0.043 per cent.

Process of Manufacture

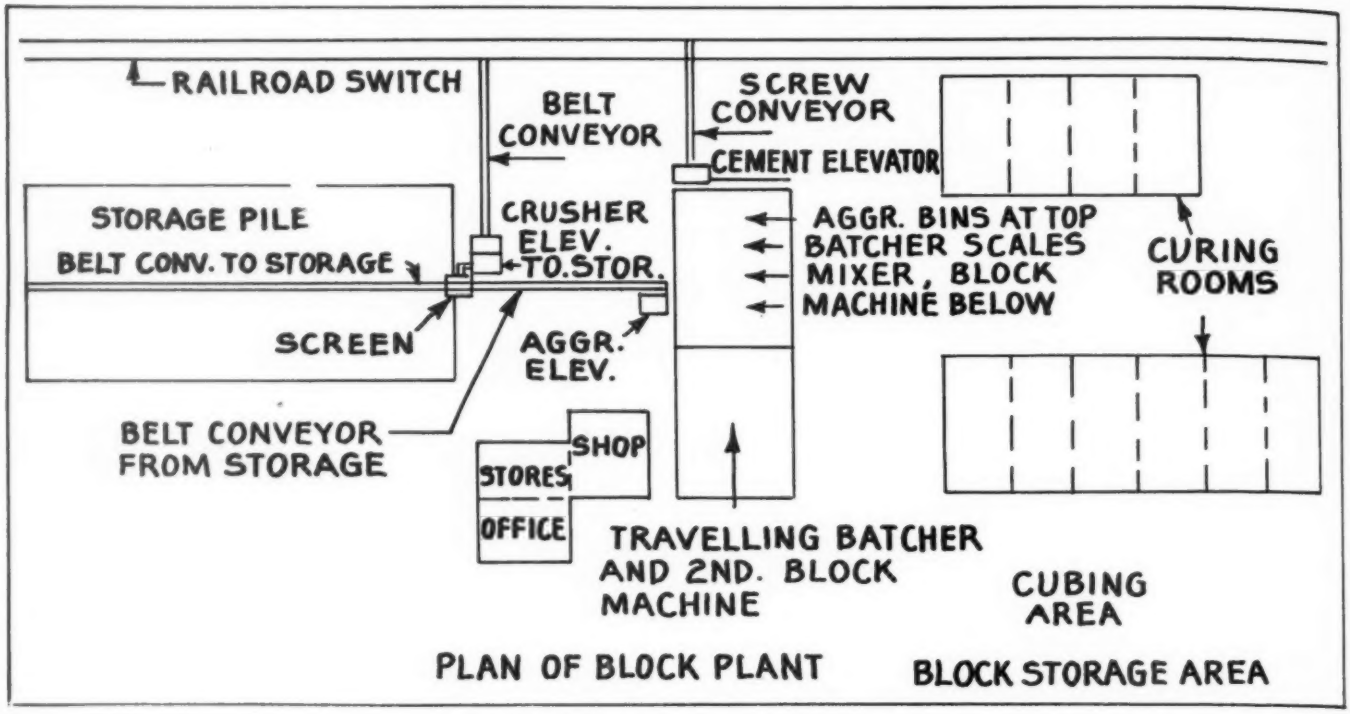
Cinders are quarried and shipped in side-dump, gondola, railroad cars from the natural deposits situated in New Mexico, about 50 miles west of El Paso. The material is unloaded onto a belt conveyor, screened through a 3- x 5-ft. Diester, ½-in. mesh, vibrating screen. The oversize cinder is crushed through a set of rolls to a maximum of ½-in. diameter. An elevator raises the crushed cinders onto a long horizontal belt conveyor, at the top of a steel supporting structure, from which they may be dropped upon any part of the storage pile.

Due to the very dry climate, the annual rainfall seldom exceeding 9 in., it is not necessary to dry the cinders.

Stored material is reclaimed by means of another conveyor belt, situated under the center of the storage pile, extending horizontally the full length of the storage section. Next, an elevator raises the cinders to a double-deck, 3- x 5-ft. Diester vibrating screen above the batching bins. Here the cinders are graded to two sizes: fines under ¼-in., and coarse from ¼- to ½-in. The 208 cu. yd. batching bin contains four compartments: One for each of the two different sizes of aggregates, one for bulk cement, and the fourth compartment may be used for either fine or coarse aggregate as required. These materials are then batched by weight, delivered to the Besser Super-Vibrapac which automatically makes three 8- x 8- x 16-in. blocks at a time, 3.3 cycles per minute. An air-lift hoist off-bearer is used to



Overhead track supported from T-frame to unload cubed block at job site

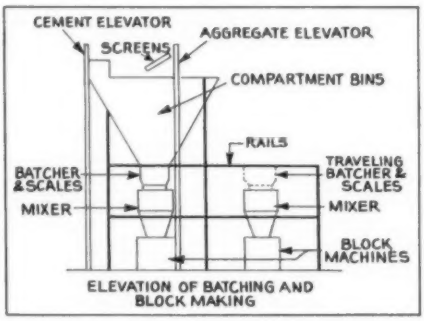


Plan of block plant, curing rooms, and cubing area

move the blocks to racks, and high-lift trucks transport the racked blocks to one of the ten steam-curing rooms, each of which measures 13- x 30-ft.

Curing Cycle

After the curing rooms are filled with blocks, they are closed, and following a 30-min. initial setting period, steam at 25 p.s.i. is turned into the room from pipes having a series of spaced jet outlets until the temperature reaches 180 deg. F., and the humidity reaches 100 per cent. This requires three to four hours, depending upon the season of the year. The steam is then turned off, and a minimum of 12 hours soaking period is allowed. During this time considerable heat, developed by the hydration of the cement in the blocks, plus the heat capacity of the block and pallets and the insulating effect of the curing room walls, prevents a rapid fall of temperature, so that when the rooms are opened to allow the blocks to cool, they are still at about 130 deg. F. At this stage, each of the steam-cured, standard size blocks contains about one pound of easily evaporated water, which is soon lost to the air of the dry Southwest climate, thus bringing the weight of the block as delivered to the customer to 26 lb. Quality and superiority of product is the goal striven for in each step of the manufacturing operation.



Elevation details of plant

By means of high-lift trucks the blocks are transported to the cubing area where an air-lift hoist "cubes" the blocks into cubes of about 75 blocks each. The cubes are then removed to the storage area where they are piled three cubes high. The blocks await their turn for shipment, the oldest being delivered first. Thus, in the fabrication of the blocks every operation of the plant is mechanized, and from the cinder to the job site the blocks are not manually handled until the mason sets the blocks in the wall.

Stockpiling cubed block with lift truck

Truck Unloading Equipment

One novel and ingenious example of this reduction in labor is the method of unloading blocks from the delivery trucks. This was devised by the Atlas Lime Co., with the assistance of the Allison Steel Manufacturing Co., Phoenix, Ariz.

The lower row of blocks in a cube are piled so that their core openings line up and steel bars (or the forks of a high-lift truck) can be shoved through these openings. To unload the blocks a steel "bridle" is then connected to the bars and attached to two-ton Budgit chain blocks, which travel by means of rollers on a horizontal steel

track elevated above the truck and extending the length of the track platform and enough beyond the back of the truck to allow picking up and lowering cubes to the ground. The cubes to be loaded are deposited on their respective sides of the truck by means of high-lift trucks and are taken off by rolling to the rear of the truck and by lowering to the ground. This unloading equipment greatly expedites delivery of blocks and should interest other block manufacturers because of its time and labor saving ability. Ten cubes (750 blocks) are loaded onto each truck. It now requires not over 20 minutes for a truck driver and helper to unload the 750 blocks, whereas previously it took these men two and one-half hours.

Construction Materials in the Southwest

Adobe was the original building material of the Southwest pioneers, and structures made of this drab material were usually improved in appearance by a coat of white lime plaster. These structures are an integral part of the early romantic and rugged history of this region. Next, 'dobe was replaced as a building material by burned clay brick (for a long period the El Paso City Building Code did not allow the construction of wooden buildings), burned brick being more adaptable to later engineering and structural requirements than 'dobe. Now lightweight concrete building units, combining the insulating values of adobe with the strength and permanence of brick, are displacing brick as a popular building material. Of these, the volcanic cinder units of the Atlas Lime Co. predominate for use in business and residential construction to such an extent that a second Besser is now being installed.

When increased insulation value is desired, the company supplies sized volcanic cinders to fill the cores of the blocks after they are placed in the wall of a structure. If the customer desires to waterproof the exterior surface of his block walls, or if his esthetic tastes desire a certain surface texture or color of walls, the company also manufactures water-proofed paints, colored cement paints, and stuccos.

Officers of the Atlas Lime Co. are: John P. Sheehan, president and founder of the company; Harry M. Frank, vice-president in charge of production; Wayne Watson, in charge of sales; and W. B. Medlock, superintendent of the concrete block plant.

Cinder Preparation

(Continued from page 145)

joints of block. The other reinforcing comprises two crossed tie rods with suitable buck-staves on the exterior of the bins. The aggregate bins each hold about 80 cu. yd. of material. A 450-bbl. Johnson bulk cement handling system has been installed.

Cinders purchased from Sigurd Bo. of Rochester, are used, as well as washed sand and gravel and Celocrete. Cinders in the area, partially due to the electrification of some of the major railroads, are becoming more difficult to secure. Cinders are crushed and washed by the source of supply before delivery. The company makes 3-, 4-, 6-, 8-, 10-, and 12-in. block in modular sizes as well as brick, and the 16- x 16-in. and 16- x 20-in. chimney block—all on the same machine and pallets. All types of lintels also are manufactured.

After curing block are hauled to the cubing space by one of three Erickson lift trucks. Two of the trucks have platforms and the third, forks. Each cube of blocks comprises 90 standard 8's.

Aggregates delivered to the plant are elevated by a bucket elevator that discharges to a short shuttle conveyor over the three aggregate bins. Mixing is done in a 50 cu. ft. Stearns batch type mixer. Winslow scales and traveling steel hopper are moved by an over-head rail system under the bins for discharge to the mixer. A small Westinghouse Air Brake Co. compressor supplies air for the offbearer at the machine. The plant building has been so designed that a second machine can be easily installed. A coal-fired Kewanee boiler supplies steam for the curing kilns.

The company's offices are at the plant, 186 Norman St. Alden C. McGuire is president of the Comac Builders' Supply Co. and Ralph J. Dalby is vice-president.

Lift truck which is used to yard and stack cubed block

Iced Concrete

BEFORE FORT GIBSON flood control and hydroelectric dam can be finished, 500,000 cu. yd. of concrete—all iced—will have been poured. Iced concrete makes better dams according to U. S. District Engineers who are building the $83,800,000 structure on the Grand River, near Muskogee, Okla.

An ice-making plant has been erected on the site, and the mixing is done to insure strength in the finished structure. When concrete is setting, chemical reactions generate internal heat, and before the mix is made materials lying in the open absorb heat, which heat, in a massive structure like a dam, dissipates slowly. This could impair the strength of the concrete.

Ice added to the concrete mix keeps the temperature within safe limits. In one test, the temperature of a batch was lowered from 95 deg. F. to 53 deg. F. by mixing 162½ lbs. of ice to each cu. yd. of concrete. Three big Vogt ice-making machines furnish the ice at Fort Gibson, each machine having a capacity of 60 tons per day, and consisting of a large cylinder containing 300 2-in. tubes inside which the ice is formed. Liquid and gaseous ammonia circulates around the tubes, and cutting knives slice the ice into ½-in. lengths. The pieces are then fed into a hopper where they are automatically weighed and injected in desired amounts in the concrete mix.

The U. S. engineers are of the opinion that this is the first time this technique has been employed on a large construction project, and state that it promises to eliminate previous cooling liquids through pipes.

Seek Engineering Draftsmen

QUALIFIED engineering draftsmen are being sought by the Bureau of Reclamation to assist with heavy construction work in arid sections of the West. The Bureau is particularly anxious to generate the applications of those who by training and experience are qualified to perform work at the drafting board involving high-grade tracing, detailing, and making minor corrections on drawings prepared by others. Application forms may be secured from the Secretary, Board of U. S. Civil Service Examiners, at any first- or second-class Post Office or from the Executive Secretary, Central Board of U. S. Civil Service Examiners, Bureau of Reclamation, Denver Federal Center, Denver, Colo., and must be filed with the latter.

Expect 1948 To Top Record Year For Concrete

National Ready Mixed Concrete Association convention reports indicate better cement supply in 1948. More sales promotion needed

SOME of the convention papers and events of interest to the ready-mixed concrete industry are covered in our report of the 32nd annual convention of the National Sand and Gravel Association, also in this issue

Harold Tardy, Lynn Sand & Stone Co., Swampscott, Mass., operating lever

of ROCK PRODUCTS, but papers and discussion for separate sessions of the National Ready Mixed Concrete Association convention, held the week of January 19, are herein reported.

New Officers

C. "DOLLY" GRAY, Ready Mixed Concrete Corp., Indianapolis, Ind., was elected president of the National Ready Mixed Concrete Association to succeed Frank P. Spratlen, Jr.; ROBERT F. PORTER, Harry T. Campbell Sons' Corp., Towson, Md., vice-president; and WILLIAM MOORE, J. P. O'Connell Co., Boston, Mass., secretary-treasurer.

New members of the Board of Directors are R. C. Collins, Warner Co., Philadelphia, Penn.; A. R. Shiely, Guaranteed Concrete Co., St. Paul, Minn.; M. Eugene Sundt, Albuquerque Gravel Products Co., Albuquerque, N. Mex.; Herbert G. Jahncke, Jahncke Service, Inc., New Orleans, La.; and A. C. Modahl, Modahl and Scott, Bloomington, Ill.; and Nathan C. Rockwood (honorary), ROCK PRODUCTS, Chicago, Ill. R. McLean, The Jaeger Machine Co., continues on the Board as chairman of the Truck Mixer Manufacturers Bureau.

BUSINESS PROSPECTS

PRESIDENT Frank P. Spratlen, Jr., Denver, Colo., in his opening address before a meeting of the National Ready Mixed Concrete Association, prefaced his remarks with the statement that "This has been a year of transition and, we hope, clarification. Although different localities have encountered varied local conditions, on the whole the same general problems beset all of us." He spoke briefly of the cement shortage treated in full in the address of Vincent P. Ahearn.

Mr. Spratlen gave a general account of work accomplished by the association in the past year, laying particular emphasis on the industry safety drive. Later in the meeting he announced members of the 1948 Safety Committee: Harry F. Thomson, General Material Co., St. Louis, Mo., chairman; Robert Michell, Consolidated Rock Products Co., Los Angeles, Calif.; J. Foster, Jr., Warner Co., Philadelphia, Penn.; Robert F. Porter, Harry T. Campbell Sons Corp., Towson, Md.; and Thomas E. Popplewell, Ft. Worth Sand & Gravel Co., Ft. Worth, Texas.

VINCENT P. AHEARN, executive secretary, in his report dealt with achievements of the association in the year just past. Mr. Ahearn's opening statement said that the year 1947 saw the greatest amount of ready mixed concrete placed in the entire history of the association. He reported that the association now had the largest membership in its history: 280 active members and 42 associate members; "which is normal since our industry is growing and since our association is vigorously rendering aid in every major problem facing the members."

Mr. Ahearn also spoke of the recently issued association booklet: Standard Clauses for Sales Agreements, developed by the merchandising committee.

Stanton Walker's paper stressed the growth of the industry and the resultant need for solving several major problems which face producers. In 1942, he said, approximately 25,000,000 cu. yds. of ready mixed concrete were produced by the industry, while in 1947 the figure was 20,000,000 cu. yds., with approximately 75 per cent of the total amount produced by association members in the latter year.

Durability, said Mr. Walker, is the number one problem facing the industry today, with apparently the key resting in the matter of proportionings; i.e., water, cement, aggregate ratios. Quality of ingredients was mentioned as being almost equally important, and the association work regarding chemical content of various cements as well as comparative hardness of aggregates were mentioned. In summing up this part of the address, Mr. Walker said: "The ready mixed concrete industry can contribute to

Stephen Stepanian, F. W. Popplewell, newly elected president of N. S. & G. A., and M. Eugene Sundt

more durable concrete by proper attention to control of quality; judicious selection and use of ingredients; and, in some cases, advice to the user of the concrete concerning placement, curing, drainage, etc."

In speaking of association tests regarding durability, he pointed out that apparently the amount of cement in the mix did not have too much to do with durability; i.e., 5½-sack concrete has greater durability than 6½-sack concrete. "Air entrainment seems to be the brightest spot in the durability picture," but he went on to say that it was not, per se, a cure-all.

The association will support a graduate fellowship at the University of Maryland, known as the Stephan Stepanian Fellowship; leading to the degree of Master of Science, but that due to overcrowding of university facilities and faculty, the fellowship is not expected to start until 1949. Mr. Walker also mentioned that the Short Course for industry technicians, held at the University of Maryland, is now a joint venture of the Ready Mixed Concrete and the Sand and Gravel associations.

James R. Farrington and W. J. Rogers, part of the New York delegation

Cement Supply In 1948

IN AN ADDRESS before the National Ready mixed Concrete Association, Vincent P. Ahearn, executive secretary, forecast the supply of cement in 1948, basing his remarks on replies to letters sent to executives of all cement companies in the United States. The three questions asked in each of these letters follow:

1. How will cement supply in 1948 compare with the total available in 1947?

2. Was cement supply restricted in your area in 1947, and if so, what were the causes?

3. Did export commitments reduce the domestic cement supply in 1947, and will export commitments affect the domestic market in 1948?

Mr. Ahearn stated that he received replies from 52 cement companies, well distributed geographically and as to capacity. From these letters, cement shortages last year can be traced to comparatively few major causes, principal of which were: equipment and parts shortages; railroad car shortage; and unprecedented demand in certain areas. Quite a few companies mentioned reduced cement output caused by a shortage of coal, particularly coal of high quality.

Where there were sustained cement shortages in specific areas in 1947, there were rumors about the effect of cement exports on domestic supplies. These domestic shortages, however, were not caused by export commitments. Those who do export were unanimous in saying that if they have to choose between the export and the domestic markets, they will take care of the domestic market first, so long as the choice rests with them. Data developed by the U. S. Bureau of Mines told a revealing story as far as cement reaching the export market was concerned, only 3 per cent of total cement manufacture was exported.

Mr. Ahearn said that the friendly tone of the letters received in reply to his questionnaire was worthy of special notice. A good many of the replies went a good deal farther than was indicated by the three questions asked, and spoke well of present and future cooperation between cement producers and the ready mixed concrete industry.

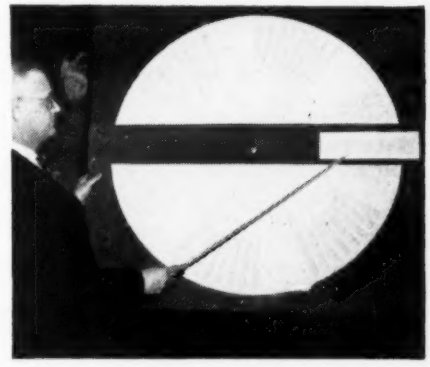
"It looks as though we can depend in 1948 on a relatively larger cement supply; but we are warned in more than one letter that cement shortages, particularly in certain areas, may persist in 1948." Mr. Ahearn continued by saying that the over-all cement supply should increase about 10 per cent, assuming the industry has no labor troubles and a sufficient number of railroad cars. The above statements were based on the industry survey, showing new production facilities being built by several companies (particularly in areas that felt the cement shortage last year the most). Existing plants are being improved and more efficient operations are expected to follow. New equipment is still hard to get, but cement plants that were badly battered by war time demands are being rehabilitated in the expectation that the demand for cement will continue to be strong for years to come.

Mr. Ahearn referred to freight rate increases, and the effect such increases would have on an industry using heavy-loading, low-value commodities such as cement and aggregates. He pointed out that the 20 per cent increase since last October, with still further increases in prospect, would have the effect of driving many producers out of the market.

Summary

In conclusion, Mr. Ahearn said: "If governmental estimates regarding the last two months of 1947 are substantially correct, the cement industry will have produced more cement in 1947 than in any other year in its history, despite a series of setbacks caused by strikes, car shortages, adverse weather conditions and the difficulty of getting badly needed parts and supplies. The cement industry has every prospect of going ahead still farther in 1948 with another new production record, but demand will be strong and our industry will have cement procurement problems hardly less serious than those of 1947."

J. H. Traub, Concrete Supply Co., Evansville, Ind.



Bob Porter explaining proportioning scale for compensating for moisture variations in sand used by Harry T. Campbell Sons Corporation

R. E. Grogran, Grand Junction Building Materials Co., Grand Junction, Colo., and J. H. Stevenson, Hillsdale Gravel Co., Sweetwater, Texas

C. Dolly Gray, Indianapolis, Ind., the new president of N.R.M.C.A.

SALES PROMOTION

SALES PROMOTION practices of the ready mixed concrete industry were considered by ROBERT C. COLLINS, chairman of the Committee on Merchandising, in his paper, "Suggestions for Sales Agreements in the Ready Mixed Concrete Industry." Previous to his address those present were given a printed booklet reviewing the work done in 1947. The speaker emphasized the point that he was not trying to sell the industry an idea but that here was a merchandising group that had some $75,000,000 invested in ready mixed concrete plants and equipment with 1946 sales close to $125,000,000. He said that in 1946 23,500,000 bbl. of cement and 32 million tons of aggregate were consumed by the industry. For 1947, the speaker estimated sales at $135,000,000, and 25,000,000 bbl. of cement and 34,000,000 tons of aggregate would be used. With an industry of such magnitude, he thought that the subject of a sales agreement was important. No national pattern for such an agreement could be easily worked out as locality conditions varied too much, but the basic fundamentals could be outlined and the individual problems left to each operator.

The speaker reviewed the selling prices of ready mixed concrete, comparing present prices with those in related industries. Taking 1939 as the index year at 100, the 1947 prices for all building materials was 205.3, for brick and tile 159, for lumber 311, for paint 192, and for plumbing 170. For ready mixed concrete the index showed a low of 131. Portland cement, he pointed out, was 140 for 1947 in his area. He also outlined some of the benefits from ready mixed concrete, stating that aside from the quality improvements, the construction season has been lengthened and extended on through the Winter

(Continued on page 154)

EXHIBIT VIEWS

ON the page to the right are additional pictures of manufacturers' exhibit booths, most of them as seen during the National Sand and Gravel Association and the National Ready Mixed Concrete Association conventions.

(1) **Dewey & Almy Chemical Co., Cambridge, Mass.** In this booth were four different types of Darex (air-entraining additive) dispensers mounted on the backdrop of the display. These four dispensers covered applications in ready mixed concrete plants and for paving mixers. In addition, the booth contained an air-entrainment testing device and a hand operated dispenser for Darex. **Butler Bin Co., Waukesha, Wis.** In this time of steel shortage, this bin manufacturer had no display, but maintained a booth for goodwill purposes.

(2) **Harnischfeger Corp., Milwaukee, Wis.** A standard working P & H Magnetorque A-C control, used on all company shovels, was attached to a 175-lb. weight for purposes of illustration. At the opposite end of the booth was an a-c arc welding machine, with Dial-Electric control. Backdrop between these two displays held an enlarged trade-mark transparency plus photographs of shovels in action, varying in size from the ½- to the 6-cu. yd. electric model. **Bacon-Pietsch Co., Inc., New York City.** Two cut-away, cross sectional models of Blake and overhead-eccentric type jaw crushers were featured. Backdrop was formed by a map dotted with colored pins representing Farrel-Bacon crusher installations in Eastern United States.

(3) **Dumpcrete Division, Maxon Construction Co., Inc., Dayton, Ohio.** In this booth were two scale model Dumpcretes (non-agitating type ready mixed concrete haulage units) with a motor attached that kept the bodies continually raising and lowering. Mounted on the backdrop were five colored transparencies of typical applications for these bodies. **Hercules Steel Products Corp., Galion, Ohio.** Two large photographs were spotlighted in a recessed backdrop showing the company's non-agitating type ready mixed concrete haulage unit in action. Around the perimeter of the backdrop were ten enlargements of the units in actual operation. **Winch-Lift, Inc., Shreveport, La.** A small working scale model of a typical dump truck fitted with a Winch-Lift dumping mechanism was on display.

(4) **Barber-Greene Co., Aurora, Ill.** Interest in this booth was divided between a plastic, cut-away working model of an Ebersol 2-stage jaw crusher on one side and a colored sound movie of plant operations and company equipment in action on the other side. Across the backdrop between the two were mounted colored enlargements of different types of company manufactured equipment in the field. **Blaw-Knox Co., Pittsburgh, Penn.** A colored movie, featuring the company's transit-mix or agitator type ready mixed concrete delivery unit, was shown.

(5) **Dravo Corp., Pittsburgh, Penn.** A framed, illuminated photograph of a river-barge towboat formed the center of interest in this booth. Below the centerpiece were two scale models of the latest towboats constructed by this company, flanked by steel barge models.

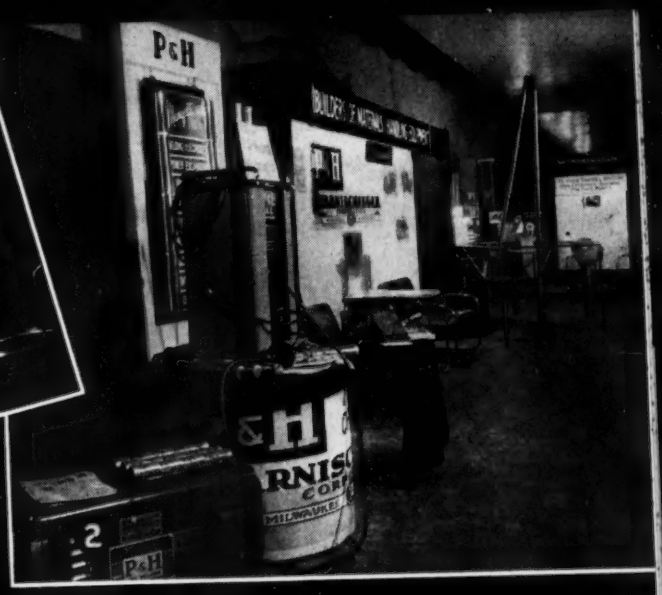
(6) **Smith Engineering Works, Milwaukee, Wis.** An 8-ft. high working model of a Telsmith crushing-screening plant; complete with jaw and gyrasphere crushers, double deck vibrating screen and a bucket elevator, working in a closed circuit, was featured. Also shown were scale working models of an apron feeder and a Vibro-King double-deck screen. **John A. Roebling's Sons Co., Trenton, N. J.** Emphasized in this display were 12-in. square samples of stainless steel wire screen cloth.

(7) **Link-Belt Co., Chicago, Ill.** A 3-ft. laboratory model Rotoscoop, a sand de-watering device, shared interest in this booth with a cable-suspended 3- x 8-ft. double deck Concentric Action (vibrating) screen, with plastic cover over cut-away portion of moving parts. **Hendrick Manufacturing Co., Carbondale, Penn.** Principal emphasis in this display was placed on the four types of screen openings available in company stock. The backdrop featured pictures of open-floor steel grid installations.

(8) **Gruendler Crusher & Pulverizer Co., St. Louis, Mo.** This booth displayed three pieces of heavy equipment in a novel manner: plastic working scale models of a hammermill, an apron feeder and a jaw crusher. The complete workings of the machines were visible through the plastic sides. **New Holland Manufacturing Co., Mountville, Penn.** Most interesting in this booth, was a plastic model, built to ¼-scale, of the company's latest machine, the Double Impeller Impact crusher. Another feature was a colored sound movie of principal uses for the product from this crusher, from railroad ballast to agricultural limestone. Forming the backdrop of the booth was a large photograph of a portable two-unit crusher. **The Truck Mixer Manufacturers' Bureau, Washington, D. C.** A large backdrop formed around a transparency of a typical standard mixer truck rating plate carried information about the Bureau and names of member companies: Blaw-Knox Co., Chain Belt Co. Concrete Transport Mixer Co., The Jaeger Machine Co., Ransome Machinery Co., and The T. L. Smidth Co.

BUTLER BIN COMPANY
COAST TO COAST

1


P&H

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WINCH-LIFT
DUMPCH

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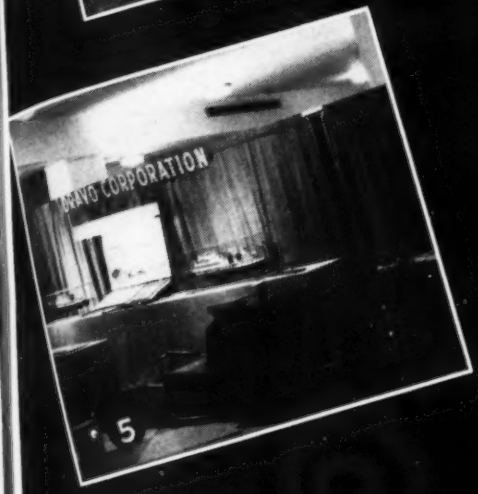
CORPORATION

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TELSMI
MINE QUARRY AND GRAVEL

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SAND-GRAVEL-STONE
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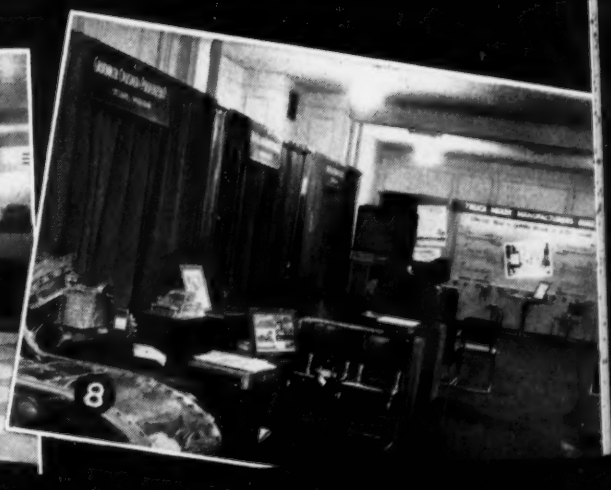


8

Frank H. Smikel, Hass Wholesale, Inc., South Bend, Ind.

months. This gave longer employment and cut down peak demands.

In the sales agreement printed in the above mentioned booklet, Paragraph 14 related to the non-responsibility of the producer for concrete to which water was added on the job. This paragraph evoked considerable discussion. LOUIS SCHILLING, Miami, Fla., asked how others checked to find if anyone tampered with the mix and that often drivers were in a locality where telephones were scarce. Most of the replies on this point hinged on a driver's notation on the delivery ticket. F. P. SPRATLIN, JR., said his delivery tickets had space provided for the driver to fill in the number of gallons of water added at point of delivery. Gordon B. Kingsbury, Coatesville, Penn., said that job failures come back to the ready mix producer, especially

M. D. Hall, C. J. Morritz, Inc., Effingham, Ill.

to the small plant operator and thought the Portland Cement Association should run an advertising campaign directed at engineers, contractors, laymen, etc., to point out these dangers. Others thought that when the concrete was dumped it was the contractor's, and, inasmuch as most contractors had a code of ethics, ready mixed producers had nothing to worry about. This was a controversial subject and much pro and con resulted, but the larger percentage of the ready mix producers who expressed themselves felt that water control was up to the producer if quality concrete was the goal.

EUGENE M. SUNDT, Albuquerque, N. Mex., asked for technical information on advertising. Later his question was answered in part by DONALD W. KELLEY, Phoenix, Ariz., who told of his book that he had published called "Design of Concrete." This was an exceedingly well gotten up piece of literature, and included a pictorial study of concrete manufacture at his operations in Arizona. He said the book cost about $4000 of which 500 copies were bound and the receiver's name stenciled in gold print on the cover. The cost included 1500 unbound copies and 2000 smaller and abstracted editions. The book, Mr. Kelly said, was prepared by a young advertising agency in Phoenix. RAY WARREN showed a pamphlet that McCrady-Rodgers Co. had sent out to the trade. Another producer showed a circular letter gotten up for contractors with cartoons around the edge showing how *not* to have a job ready for the arrival of the ready mix trucks. Mr. Spratlen said that one effective way of advertising was to have display advertisements in the building and loan company office windows.

On the subject as to the value of newspaper advertising for ready mixed concrete the discussion brought out that it was no good for large cities but had made good returns in the smaller city and town newspapers. C. W. SHIREY, Waterloo, Iowa, mentioned that good, clean, well driven trucks with polite drivers had a high advertising value and could not be too heavily stressed.

C. GRAY, Indianapolis, Ind., wanted the experience of others on the strengths of concrete delivered by pumps. His experience, he said, was that cylinders taken ahead of pump were stronger than those at the discharge. A. S. BUTTERWORTH, St. Louis, Mo., said his experience was exactly the reverse.

Returning to the subject of deliveries, JOHN W. MURPHY, Spokane, Wash., asked for expressions as to who signed the delivery ticket, whether superintendent or foreman of the job, pointing out that it was not always easy to locate these men. He also said that often the cement finisher or laborers wanted more water in the mix. The speaker replied to these questions by saying that only authorized agents of the contractor (sometimes a timekeeper) signed the delivery tickets or asked for water additions.

Paragraph No. 10 of the printed paper related to the payment for waiting time. ROBERT F. PORTER said that his company made efforts to collect the waiting time even if not paid for. It was invoiced and usually settled for on the basis of 75 per cent of the waiting time being paid for. It developed that some contractors were interested in the waiting time factor as it served as a check of their superintendent's or foreman's attentiveness.

Cost Accounting

The "Report of Committee on Cost Accounting System for the Ready Mixed Concrete Industry" as outlined in the program was headed by John W. Murphy, Spokane, Wash. He outlined the history of the program and of the cost accounting manual that had been prepared, but further work had to be done and the completed manual would be available shortly. He pointed out that it cost only a little more to get out a good and complete manual than to get out an inferior one.

Collective Bargaining Agreements

NORMAN J. FREDERICKS, secretary-treasurer, Koening Coal and Supply Co., read a paper entitled "Administration of Collective Bargaining Agreement, Ready Mixed Concrete Industry in the Detroit Area." He said in his area no formal association was set up and the agreements were made by a group that was not industry-wide. Not all had joined the group but unions in dealing with those outside the group used their contract as a basis for negotiations. Each company in his group signed the contract. Secondly, he pointed out that the contract had a clause whereby the group was not bound by breach of contract by others. Thirdly, their contract does not cover all classifications of employes, leaving out mainly the laborers. The mechanics and drivers were the main elements covered by the contract. He said it was necessary to handle it this way as his company, for instance, had other interests: coal, building supplies, etc. The teamster union contract was the key contract.

In setting up the system outside counsel was employed. He stressed the necessity of having a counsel who could get along with people and who had a give-and-take attitude in dealing with labor representatives, otherwise they might stir up discontent and do more harm than good, however, at the same time he must be firm. Their counsel, he said, was Nathen Goodnow of Detroit, and he had been particularly successful in keeping matters adjusted and on an even keel. The speaker said his group met and ap-

pointed three members to work in an advisory capacity with their counsel and the latter acted as spokesman. Questions that come up are referred to the counsel who, in many cases, makes the adjustments without the producer even being aware of the grievance. The system had worked out so satisfactorily that the union leaders now go direct to the counsel with any grievances.

The speaker said that after a contract was signed, all information was given to the employes and a notice put on the bulletin board explaining the contract.

R. V. WARREN, Pittsburgh, Penn., then followed with an outline of the procedure in the Pittsburgh, Penn., area and said that the Detroit system would not work so well in Pittsburgh because the labor unions wanted no attorneys in their discussions. Mr. Warren acted as co-ordinator for his producer group and kept a day-to-day tabulation of labor pay raises in other industries and other labor matters and this showed what was being done in the area. This information, supplemented by group discussions of six to eight members of his trade association, gave a good background of information. He said he spoke for the group and took all the shots aimed at producers. In many cases he had been called upon to make rulings that were against the producer and told of several instances in this regard. Mr. Warren prefaced his remarks by saying that he at one time had worked with his hands so had some knowledge of, and a feeling for the employe and that this had helped him in many grievance discussions.

Labor Contracts

In the discussion which followed, ALEXANDER FOSTER, JR., asked Mr. Fredericks if the working rules posted on the bulletin board were a part of the contract, or if they flowed from the contract. Mr. Fredericks answered that they were not a part of the contract. Working rules, he explained, are prepared after the contract has been signed, but are submitted to and approved by the unions.

Mr. Fredericks was asked about overtime rules in the Detroit area. He said time and one-half after 8 hours for one day or 40 hours in one week, whichever is most, collects overtime pay. On this subject Mr. Warren mentioned that in his area double time was paid after 6 p.m. provided the job started at or after that time. Carry-over jobs are not included in this time payment. Regular night shifts, through arrangement with the unions, pay 10¢ per hour over the day rate. He asked about Saturday afternoon work payments in Detroit and was told that Saturday work was time and one-half with afternoon work at double time, but for the most part there is no work done on Saturday afternoons, and if they do work, a higher price is asked for the concrete.

Safety Trophies

The conclusion of the session was in the hands of HARRY F. THOMSON, who outlined the value of safety and the insurance premium saved by an efficient safety program. About 40 per cent of the industry reported in the safety program, and he urged all to enter the safety contest. Mr. Thomson said Class "A" plants were those manufacturing 20,000 cu. yds. or more per year, and Class "B" were those manufacturing less than 20,000 cu. yds. per year. For the coming year, these figures were raised to 40,000 cu. yds. He said the man-hours required to make a yard of concrete for Class "A" plants was 0.91 man-hour delivered, and for Class "B" 1.31 man-hours.

The safety trophy for the large plant class was awarded to the Frank J. Knight Co., Centerline, Mich., with TED KNIGHT accepting for his company. For the small plant class, the award was made to the Grand Junction Building Materials Co., Grand Junction, Colo., with R. E. GROGAN accepting for his company. The trophy in each award was a bronze plaque suitably engraved and donated by *Pit & Quarry*.

In the Class "A" contest, the winner was the only plant with a perfect record. In the Class "B" there were four plants with perfect records but which had less man-hours worked than the winner.

Specifications Production Problems

Concluding session of the National Ready Mixed Concrete Association was devoted to a consideration of equipment and an open forum on ready-mixed concrete specifications and production problems.

H. F. THOMSON, chairman of the committee on truck chasses led off with a report from a questionnaire sent to the industry by his committee. Among the features of moving equipment causing most operating difficulty were the rear springs, clutch, steering gears and axles, with the preponderance of troubles in the rear ends.

Apparently, from his questionnaire, it has been widespread practice to load truck mixers in excess of manufacturers' recommended limits; as high as 153 per cent of ratings in exceptional cases. Mr. Thomson said that with new urban highways being built it may be anticipated that more and more cities will apply state weight limitations. His committee is to plan joint conferences with the manufacturers of truck equipment for further cooperative study of problems encountered.

Factors in the correct application of motor trucks to the ready-mixed concrete industry were considered by R. CASS, assistant to the president, White Motor Co., in a talk illustrated by a number of charts covering rating

R. V. Roupe, Des Moines, Iowa, right, visits with E. C. Anderson

Herbert J. Scott and E. C. Morgan, Nazareth Cement Co.

A. C. Thomas, to the left, and Alan C. Squires, American Aggregates Corporation

C. E. Nichols and Lewis W. Beaumont Granite Concrete Block Co., Elyria, N. Y.

Mrs. Genevieve Miley, of the Truck Mixers Bureau, Washington, D. C.

factors. Among the factors discussed were determination of exact operating requirements, engine horsepower needs, selection of correct truck models, sizes and types of tires for various applications, types of rear axles, transmissions, etc.

The White Motor Co. has prepared a publication of service rating factors, applicable for truck equipment in general, copies of which may be secured from the Dartnell Corp., Chicago, Ill.

The open forum was led off with brief talks by STANTON WALKER on the subject of specifications for ready-mixed concrete and by J. F. BARBEE, Ohio State Highway Department, on the use of ready-mixed concrete in highway construction.

STANTON WALKER briefly reviewed development of the ready-mixed concrete industry from the time Stephen Stepanian filed his patents in 1916 and, he said, the first formal specifications were written by the American Concrete Institute in 1930. Now, all but a few states provide for ready-mixed concrete in their specifications, either as special provisions or for optional use by contractors.

Mr. Walker called attention to the wide variations in specifications between states. Five states limit mixing time, for example, to one and one-half hours, while 11 stipulate 45 minutes and 7 limit mixing to 30 minutes. Three states require that mixing be done at the jobsite and 12 stipulate a maximum interval between delivery of loads. Twelve states require the use of revolution counters and six require locking devices. California and New York specify the use of spreaders while Connecticut requires that an extra one-half sack of cement be added per cu. yd. to butter the large surface area inside the mixer, each batch to be charged into a clean mixer. A.S.T.M. specifications for ready-mixed concrete were revised in 1947 to provide cautionary clauses for delivery in non-agitating equipment. Among the provisions are that bodies be smooth, water-tight and have control gates; have water-tight covers for protection; and provide uniform discharge not more than 45 minutes after the water had been charged.

Mr. Barbee mainly discussed the use of ready-mixed concrete for pouring highway structures and its limitations for paving. Ohio poured 200,000 cu. yd. of concrete in 1947, as compared to 500,000 cu. yd. prewar, of which 48,000 cu. yd. was ready-mixed concrete for structural items. Some 60 per cent of all highway structures were of ready-mixed concrete, while only 5 per cent of the 152,000 cu. yd. of paving concrete was ready-mixed. Its use has proven economical for the smaller pours but, in paving, it has been difficult to maintain speedy continuity of pouring while permitting producers to handle their regular commercial business.

Another disadvantage to its use on big paving pours, according to Mr. Barbee, is that long mixing results in de-airing the air-entrained concrete. The air content increases up to 20 minutes of mixing time and thereafter decreases. For this reason, it has proven better on long hauls to add the air-entraining agent to normal cement at the mixer. To service highway projects, Mr. Barbee said that a mixing plant must have accurate batching equipment, sufficient storage for approved aggregates and for tested cements reserved for the exclusive purpose. Non-agitating delivery equipment is not approved by the department but is the subject of current research.

ROBERT PORTER, Harry T. Campbell Sons' Corp., Towson, Md., showed a wheel-type chart used by his company to assist the batcher in proportioning aggregates quickly in compensating for variations in moisture content. The chart also provides batch weights for different sizes of batches.

Daniel Miller, Jr., Portland, Penn.

Much discussion developed around the loss of entrained air in concrete during delivery, for drum-type and non-agitating bodies, with no definite conclusions reached.

Commercial testing laboratories came in for much criticism because of non-uniformity of strength tests where cylinders were made under regulated conditions. One producer told of differences up to 1000 p.s.i. when identical cylinders were tested by different commercial laboratories. One thing is certain and that is that controlled conditions must govern in the interval after cylinders are made until they are tested.

Ohio Ready Mix Producers

At a luncheon meeting of the Ohio Ready Mixed Concrete Association held in connection with the convention of the National Ready Mixed Concrete Association, with Ralph H. Anderson as chairman, overloading and permissible loads for ready-mixed concrete truck equipment were discussed.

An official of the Ohio State Highway Department told why loading regulations must be enforced, considering the competition within industry as a factor which must be recognized, and the effects of overloading on pavements and on highway bridges in particular. He said that 12½ per cent of bridge failures in the state were the result of fatigue from the repeated pounding of trucks. One-half of the 6300 bridges over 20 ft. long in the state are inadequate now, he said, and the cost of replacement makes it uneconomical to permit overloads.

Following this presentation, representatives of companies manufacturing trucks and truck mixers discussed load distribution and developments of recent years to lighten equipment and thereby increase permissible payloading. One manufacturer pointed out that a saving of 500 lb. in a chassis would enable carrying a three per cent bigger payload. Thusfar, lightweight metals such as magnesium and aluminum have proven too expensive for delivery equipment.

Addresses Convention

C. DOLLY GRAY, president, Ready Mixed Concrete Corp., Indianapolis, Ind., addressed the recent Chicago convention and short course of the Wabash Valley Ready-Mixed Concrete Association, of which he is a member. Mr. Gray is the new president of the National Ready Mixed Concrete Association.

Cement Prices Up

DUE PRIMARILY to the increased cost of coal, most major cement companies have announced or will soon announce increased prices averaging 10¢ per barrel for cement. In addition to increased coal cost, increased labor and transportation costs have been added to the cost of cement production.

Wisconsin Products Association Holds Meeting In Milwaukee

OVER 200 concrete masonry producers, representing 117 separate plants, attended the 28th Annual Convention of the Wisconsin Concrete Products Association in Milwaukee, January 29 and 30.

The program was highlighted by speeches on modular sizes of units, modern curing methods, technical problems confronting the industry, and the need for launching comprehensive advertising campaigns by each individual plant at once.

Block Tests Important

One whole morning was devoted to an inspection trip through the testing laboratory of the City of Milwaukee where many manufacturers send block for testing. Here they saw exactly how concrete block specimens were tested for compressive strength, absorption and moisture content. All details of these tests, together with those of the freezing and thawing tests, were carefully explained by R. A. BURMEISTER, head of the laboratory. The importance of periodic testing to be certain that the product continually meets specification requirements was stressed by Mr. Burmeister.

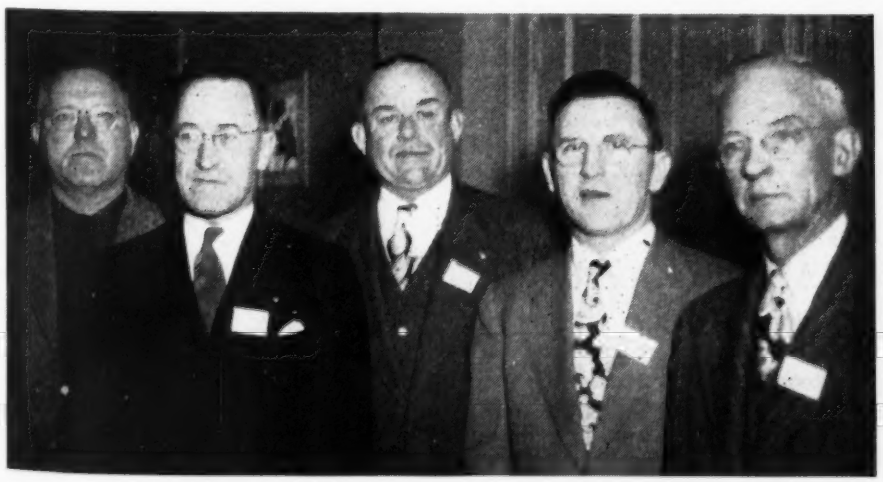
Architects' Suggestions

On Thursday afternoon two Milwaukee architects gave challenging talks on concrete masonry. ALLAN WALLSWORTH, speaking on the application of modular coordination to concrete masonry construction, urged the adoption of modular sizes throughout the industry.

"High construction costs today depict not only manufacturing conditions and ineffectual use of labor, but also portray lack of basic planning in construction," said architect Wallsworth. "Throw the 6-ft. rule off the job—replace it with a module of 4 in. and make it the universal language in our industry. This module will reduce costs by improving coordination and understanding between designer, supplier and contractor."

Architect EDMUND J. SCHRANG aroused the convention with his appraisal of concrete masonry units. "Your product can stand on its merits as the leader, not the imitator of competing materials. In strength, texture, insulation value and fundamental economy it leads all masonry materials. You need to improve its appearance in the wall and give it a new name."

Mr. Schrang is the architect for the model home now under construction in Milwaukee by the Milwaukee Board of Realtors in connection with the 1948 Home Show. This model home is being built with concrete masonry walls and concrete first floor. He explained why this material was selected for this year's model home. "The very pleasing appearance of the random ashlar pattern of the walls of this house and the economy effected by the use of concrete masonry should greatly stimulate the use of concrete masonry for housing throughout the metropolitan area," said Mr. Schrang.



Some of the new officers and directors recently elected

MODERN CURING METHODS

CURING of concrete products has developed into a controversial subject, said GEORGE A. MANSFIELD, Huron Portland Cement Co., in his opening remarks before the Wisconsin Concrete Products Association.

Owing to the heavy demand for concrete products, producers have sought some effective, economical method of curing that would speed up the process and still result in a tough, durable product. Under the longer period of curing, the moderate curing temperatures in the 100- to 120-deg. range had been satisfactory and it was thought that higher temperatures would provide an accelerated and more efficient curing cycle. Mr. Mansfield pointed out that this resulted in a variety of applications of heat and moisture to develop curing temperatures from 150 to 200 deg. in a kiln at atmospheric pressure with the emphasis placed on heat rather than moisture. The resulting products were therefore very often brittle as the cement was damaged by high temperature curing with insufficient moisture.

Mr. Mansfield illustrated the difficulties of maintaining moisture by a chart giving the thermodynamic properties of moist air at various temperatures. This chart very clearly showed that to obtain 100 per cent humidity at higher temperatures a much greater quantity of water or moisture must be introduced into the kiln. He also pointed out that the factor of saturation pressure of moisture in the kiln atmosphere must be considered. This increases, for example, from 0.51 p.s.i. at 80 deg. to 5.99 p.s.i. at 170 deg. and up to 11.53 p.s.i. at 200 deg. As the vapor pressure within the kiln is higher than the vapor pressure outside the kiln, the moisture within the kiln will be forced to the outside atmosphere. This vapor pressure is also present in the masonry unit and, because of the differential in pressures between the kiln atmosphere and the concrete, moisture will be forced out of the masonry unit by evaporation, the degree of removal being dependent upon the temperature of the curing atmosphere and the length of time the masonry units are subjected to such temperatures and differentials in saturation pressures. Measurements may indicate 100 per cent humidity under these conditions but actually moisture is being removed from the masonry units, and the portland cement is being damaged because of insufficient moisture in contact with the cement. Mr. Mansfield said that tests indicated that a minimum water-cement ratio of 0.44 by weight of cement is required, which is equivalent to approximately 5 gal. of water per sack of cement.

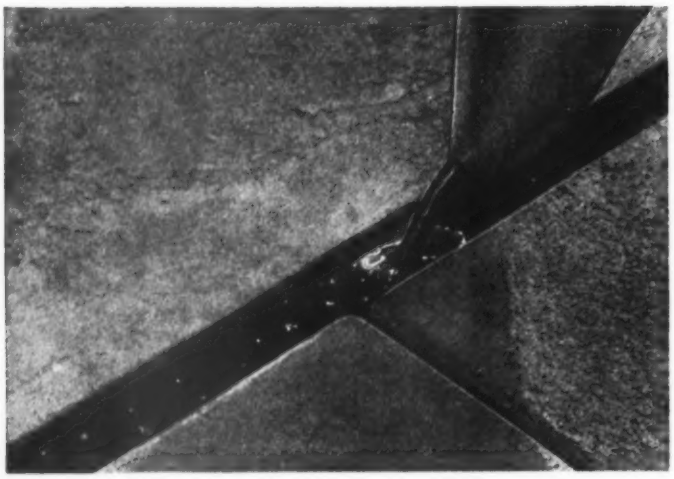
Another factor, he said, that should be considered in curing concrete masonry is the carbonation of the concrete. When sufficient moisture is not present with cement during the curing cycle, carbon dioxide from the kiln atmosphere is absorbed by the concrete. If carbonation occurs before or during the period that the portland cement hydration compounds are being formed, it is detrimental, but if it occurs following the hydration, then it is beneficial.

Mr. Mansfield described the live steam method developed jointly by the Concrete Curing Corporation of Detroit, the Huron Portland Cement Co., and the Wm. Moors Concrete Products. The tests that were conducted in

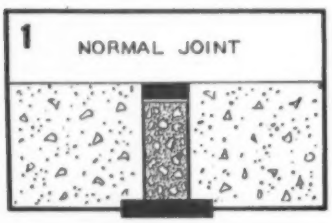
(Continued on page 160)

Para-Plastic and Co

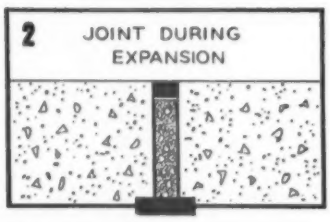
Offer Many Entirely New Profit Opportu



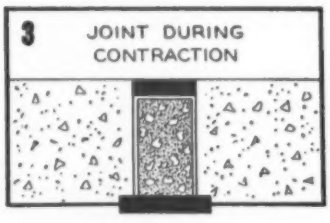
Hot Pouring Para-Plastic Over Kork-Pak Filler



KORK-PAK fills the joint fully at the time of insertion, and rests at the bottom on the premolded strip of Para-Plasic called Baseal. It is covered at the top with hot poured Para-Plastic.



During compression, as in periods of maximum concrete expansion, Kork-Pak will not extrude. It takes the full compression exerted in the normal joint and then recovers more than 80%.



During contraction, the higher resiliency of Kork-Pak permits a more complete filling of the joint than ordinary fibre materials, thus preventing large opening between it and the concrete which could become filled with non-resilient materials and cause a blow-out.

Para - Plastic and Kork - Pak

THE IDEAL EXPANSION JOINT COMBINATION

The characteristics of these two materials go very well together in providing exceptionally fine joint protection, under all temperature cycles.

PARA-PLASTIC is a rubbery, resilient, adhesive plastic which will adhere to steel, metal, wood, tile, glass, concrete and all forms of masonry. It is co-hesive, as well as adhesive, and is therefore self-healing.

PARA-PLASTIC will not become brittle or hard at low temperatures. It remains resilient, adhesive and effective at temperatures from zero to 140° F., and in this range will maintain a positive bond, a continuous seal.

KORK-PAK is a composition of cork, cotton seed hulls and filler bound together with asphalt between two felt strips. This combination of material produces a joint filler which gives you five definite advantages.

KORK-PAK is more fully resilient. It has a greater recovery — between 80% and 90% as against 70% for ordinary fibre joints. The more fully the space below the seal is kept filled during contraction, the less danger exists of penetration of the seal by dirt, stones and other non-compressible material, which might cause a blow-up when expansion takes place.
Contractors will find that less sealing material is needed when Kork-Pak is used because it keeps the joint more nearly filled.

KORK-PAK handles readily without breaking.

KORK-PAK absorbs less water — only 8% by volume as against 15% for ordinary fibres.

KORK-PAK is non-extruding.

KORK-PAK has the desirable characteristics of the more expensive joints combined with low cost.

SERVICISED QUALITY PRODUCTS © 1920

PARA-PLASTIC is Available in Black and Colors

A ZERO-LASTIC PRODUCT

SERVICISED PRODUCTS CORPORATION

6051 W. 65TH STREET CHICAGO 38, ILLINOIS

Companion Products

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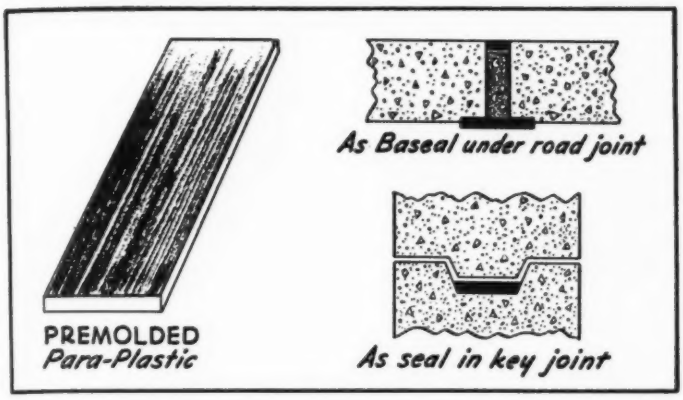
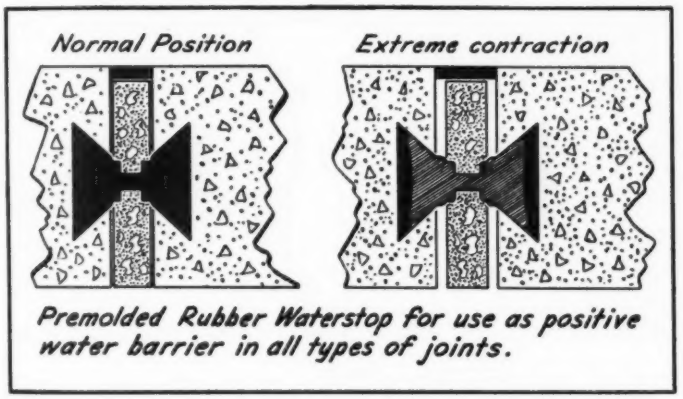
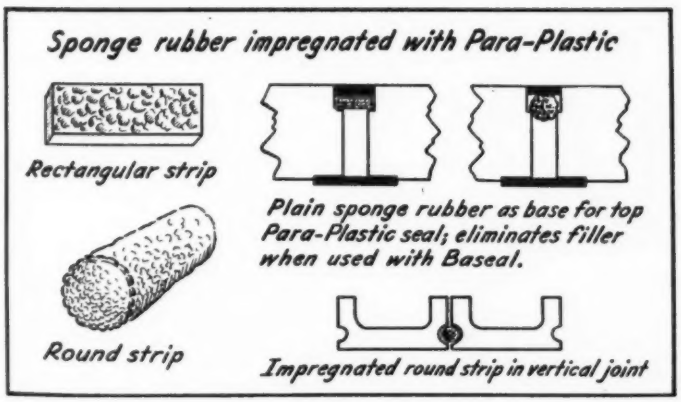



Normal Position
Extreme contraction
Premolded Rubber Waterstop for use as positive water barrier in all types of joints.


Sponge rubber impregnated with Para-Plastic
Rectangular strip
Plain sponge rubber as base for top Para-Plastic seal; eliminates filler when used with Baseal.
Round strip
Impregnated round strip in vertical joint

Better Joint Protection

AS DEVELOPED AND PRODUCED BY SERVICISED

Here are shown several combinations of Servicised Products which have a wide application in all types of construction.

Premolded PARA-PLASTIC Strips solve a definite need where a positive water seal is required in construction joints but where it is not practical to hot pour the material. The illustrations show how a ½" x 10' strip may be placed on the sub-soil directly under the road expansion joint, and how a ½" x 6" strip can be placed in a key construction joint as a positive seal where the joint is below water level.

The extruded rubber water stop was designed to replace the "metal dam" type of water stop. It has the definite advantage of being able to move with the concrete in contraction without losing seal. It will not crystalize or break in the joint. This water stop is recommended where seal against considerable water pressure is required, or wherever a dam is indicated in addition to the sealing material.

The offset joint as shown in illustration permits the use of a sponge rubber rectangular or round strip to be used as the retaining base for the top PARA-PLASTIC seal. Combined with Premolded Baseal Strip at the bottom of the joint, it provides a good joint without the use of a filler. The round strip in the lower sketch is impregnated with PARA-PLASTIC and serves as an excellent seal for vertical joints. The sponge rubber prevents cold flow of the seal.

ALMOST EVERYWHERE YOU LOOK YOU WILL FIND AN APPLICATION FOR ONE SERVICISED PRODUCT OR ANOTHER.

YOU SHOULD HAVE COMPLETE INFORMATION ABOUT THE SERVICISED LINE IN YOUR FILE. CLIP THIS COUPON AND ATTACH TO YOUR LETTERHEAD. UPON RECEIPT WE WILL MAIL A PORTFOLIO OF CIRCULARS.

Wisconsin Meeting

(Continued from page 157)

developing this process were published in an article appearing in the February, 1947, issue of ROCK PRODUCTS. He said that for this system a fire tube boiler of large water capacity and large heating surface is better suited than a self-contained boiler or water tube boiler. Excellent results have been obtained by using a boiler for preheating the make-up water before feeding the processing boiler. Mr. Mansfield emphasized the importance of designing the steam pipe lines and insulation so that the steam leaves the nozzle in the kiln in a dry and saturated condition. He said that steam lines should be at the top of the kiln as the steam will settle to the floor.

He outlined the proper curing cycle as follows: (1) kiln is charged and door closed; (2) block remain in kiln from 1 to 2 hr., for a presetting period; (3) steam enters kiln with valve wide and remains on in the kiln until the predetermined temperature is reached (period is determined by size and shape of kiln and load); (4) at end of steaming period, valve is shut off and remains off during balance of curing cycle or soaking period; (5) drying period follows soaking period by circulating air within kiln and exhausting to atmosphere. The entire curing cycle should be not less than 15 hr. from the time door is closed after charging the kiln until finally opened for stripping following the soaking period.

Technical Problems

R. E. COPELAND, director of engineering, National Concrete Masonry Association, discussed the technical problems now confronting the industry and told what steps were being taken by the national association staff to solve them. "The most important problem and the one that may be the most detrimental to continued progress of the industry is the ever increasing costs of laying concrete block in the wall," Mr. Copeland stated. He told of the enormous increase in this item during the past 15 years and how a continued upward swing might threaten the whole industry. "Modern mechanical methods for laying block in the wall must be developed if our industry is to continue to progress," Copeland concluded.

Merchandising Needed

Advertising and merchandising of concrete block came in for their rightful share of the spotlight in talks given by WM. FREDERICKS of the Arthur Towell Advertising Agency, Madison, Wis., and by Charles W. Yoder of the Milwaukee office of the Portland Cement Association.

Mr. Fredericks said that the plans should be made right now against the day when block must once again be sold in the face of stiff competition from lumber, brick, and other competing building materials. "The hey-day will soon be over, the gravy train will soon be speeding away from your plant and it will soon be vital to your continued success that you have built up a demand for your product," Mr. Fredericks said.

"Use of all the various means to this end now available should be made. Newspaper advertising, direct mail campaigns, radio talks, publicity stories in the local press and direct contact with customers and potential customers are tools that can effectively be used for this purpose. After the "gravy train" has passed it will be too late—now is the time to start an effective long-range advertising program," he concluded.

CHAS. W. YODER called attention to the facilities offered by the Portland Cement Association—prepared advertising, printed leaflets on various subjects, and plans for most types of farm buildings. "These have been effectively used by numerous manufacturers in Wisconsin during the past few years," Mr. Yoder stated, "and some of them can point to increased business as a direct result from this endeavor. The extra profit from this additional business has more than paid the cost of the entire campaign."

"Many industries spend around 10 per cent of their total volume on advertising. A few spend only 1 per cent. One per cent of the gross volume of the products industry, approximately $8,000,000 in Wisconsin, would mean an expenditure of $80,000 for advertising. It is doubtful if the amount spent by Wisconsin producers approaches even 25 per cent of this amount." Thus spoke Mr. Yoder in urging his listeners to consider embarking on an adequate advertising program. Coupled with such a campaign should be an all-out effort to service construction projects. Making certain that block are used to the best advantage and that the final structure is pleasing to the owner will pay big dividends in the form of future business, Yoder concluded.

Speaking on "America Tomorrow" CARL TAYLOR, president of the Waukesha State Bank, told his audience to be sure that the well proven principles of our democracy be preserved and protected from all attacks by Communists. All our freedoms have been responsible for Americans having the highest standard of living of any people on earth.

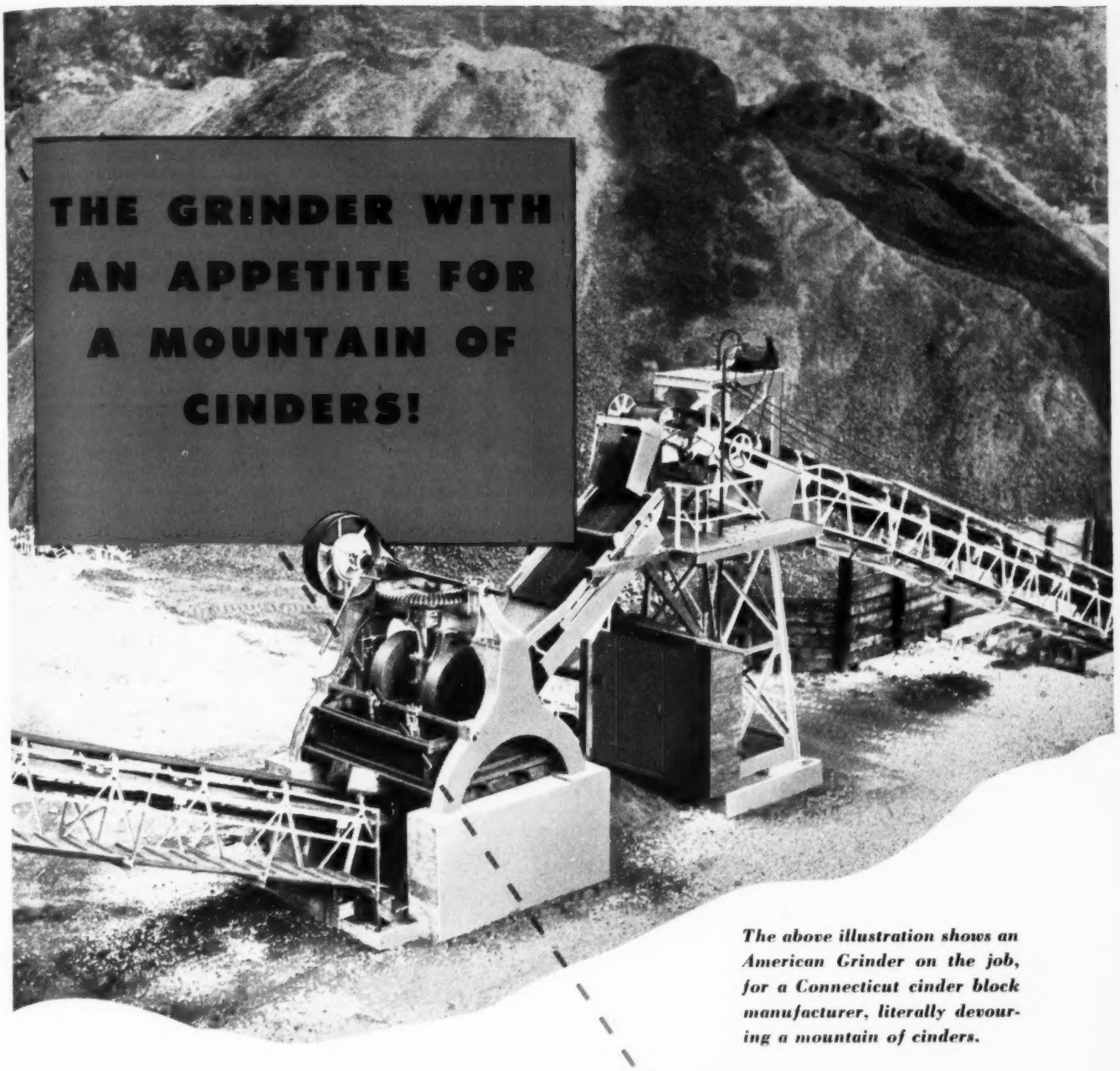
E. W. DIENHART, executive secretary, National Concrete Masonry Assn., closed the meeting with a review of how his organization functions to assist, on a nationwide scale, in the operation of each plant and the sale of each block. Membership on committees of national organizations, work with officials of the federal government, publication of the "National Concrete Masonry Association Pictorial" were a few of those mentioned.

New Officers

The following officers and directors were elected to serve for the coming year: President, William P. Siegert, Economy Block Co., Wauwatosa; vice-president, Elmer Strong, Strong Concrete Products Co., La Crosse; second vice-president, Bernard Vanderheyden, Cities Fuel & Supply Co., West Allis; secretary, A. W. Devos, Devos Block Co., Milwaukee; treasurer, Harry Sorenson, Waylite Concrete Masonry Co., Racine; Directors re-elected were Otto Ladwig, Jr., and Wm. Schneider of Milwaukee; Herb. Loucks, Madison; A. Van Ess, Green Bay, and George Andrew, Fond du Lac.

The convention closed with a banquet and evening entertainment that pleased everyone. Even Oscar Rennebohm, Governor of Wisconsin, looked in for a few minutes and addressed the group briefly. The Governor is an old concrete block man himself.

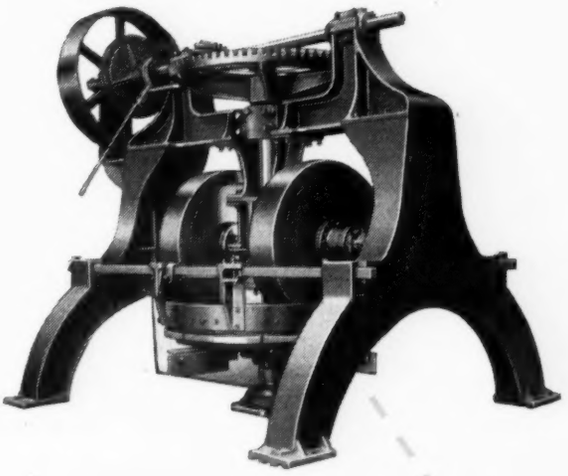
Another group at the convention. E. W. Dienhart, executive secretary, and Henry Buchholz, president of the national association, in the background



The above illustration shows an American Grinder on the job, for a Connecticut cinder block manufacturer, literally devouring a mountain of cinders.

Want big volume cinder grinding production? . . . then get all the facts about the American Grinder that lives on a steady diet of a mountain of cinders . . . and does the job right, for perfect cinder block production, with minimum maintenance cost. . . . write, wire, or phone today.

5', 7', 9' Grinders to meet your production needs.



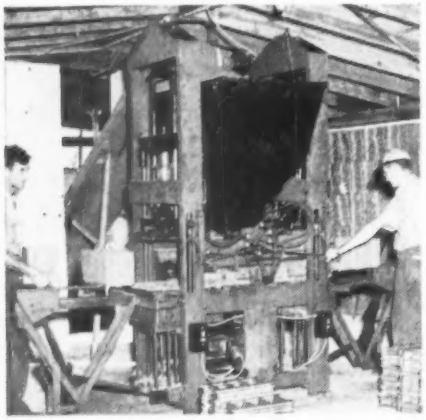
THE W. A. RIDDELL CORPORATION

BUCYRUS • OHIO

NEW MACHINERY

Hydraulic Block Machine

THE KEPLER CO., Fairmont, W. Va., has developed the Kepler Straitline block machine which is said to have an estimated production of 5000 to



Hydraulically-operated, high-production block machine

6000 block per 8-hr. day. This machine is manufactured for the Kepler Co. by the McDougal Machine Co., of the same city. Mr. Thos. A. McDougal collaborated with Kepler Brown, the inventor, in working out the engineering problems.

This hydraulically operated block machine has a two-way continuous operation, making two block while two are being stripped. Only two men are required in its operation. The manufacturing principle involves a horizontal vibration and a pressure finish. Mold boxes can be changed in 15 min. to any desired size.

It is said that the machine will handle heavy or lightweight aggregate concrete. A positive action feeder provides a feed drawer, consisting of two compartments, removable in one minute. The total gross weight of the machine is 2800 lbs. One of the machines was recently installed at the Empire Block and Cement Products Co., in Fort Lauderdale, Fla.

New $40,000 Plant Site

CONSTRUCTION of a $40,000 project to house the Mortarless Cement Tile Co., Lakeland Village, Calif., is expected to be completed this month, according to Hal Smith, owner. The new building, of concrete block construction with concrete tile roof, will be 4000-ft. square and have 3600 sq. ft. of outdoor facilities. The installation of new hydraulic equipment will triple production, and three sizes of block are to be manufactured instead of one.

Celocrete Home Exhibit

A NEW CELOCRETE HOUSE was placed on exhibit recently by Anchor Concrete Products, Inc., Buffalo, N. Y., illustrating several novel architectural features. Chimney blocks, 8- x 9-in. flue size, were laid on edge, with glass brick inserted in the openings to serve as a decorative panel on the exterior, admit light, and provide niches for plants or knickknacks on the inside.

A raised panel over the fireplace was made by bringing standard units out in 1-in. relief, and scoring vertical mortar joints in the center of each unit to create 8-in. squares. Another feature was a flagstone terrace made of red, green, and natural Celocrete units.

Low-Bin Batcher

C. S. JOHNSON CO., Champaign, Ill., has designed what is known as the Lo-Bin batcher to serve three standard size portable mixers. It has a heaped storage capacity of 30 tons with extension panels and measures 9½ ft. high. With top panels removed, the over-all height is 7½ ft. and level struck capacity is 8 tons.

Batcher hopper and scale beam box are suspended from the frame work riding on four hardened steel wheels. The hopper is cantilevered beyond wheels and end of track so that it can charge a mixer skip positioned to clear ends of track when skip swings up. Adjustable legs lower bin and batcher 9 in. or raise it 18 in. With legs removed, the lower bin section, measuring 6 ft. wide, 3 ft. 9 in. high and 14 ft. long, can be slid onto a dump or flat bed truck. Two weigh beams in trolley batcher scale have a 1600-lb. capacity each with space provided for an additional beam.

Concrete House Development

MID-WEST CONCRETE PIPE CO., Chicago, is supplying Celocrete concrete units for a large home development near Flowerfield Acres, just outside of Chicago. Over 100 ranch-style homes are being constructed on the 60 acres. Exterior walls are 8- x 8- x 16-in. blocks, furred out for plaster on the inside. Partition walls are being built of 4-in. units. The homes are of three basic designs featuring large picture windows, combination living-dining rooms, and asphalt tile floors over concrete sub-floors.

Open Bids for Concrete For Western Projects

BIDS ARE NOW being accepted from companies for three projects in Western United States. The first, the Coachella Division, All-American Canal, located near Mecca, Calif., will require 37,600 lin. ft. of precast concrete pipe and 1050 cu. yds. of concrete for construction of about 6½ miles of 78- and 84-in. high-pressure concrete pipe laterals.

The second, Hungry Horse Concrete Dam and Power Plant, near Kalispell, Mont., will require 3,000,000 cu. yd. of concrete, all classes. The dam is to be an arch-gravity, concrete structure approximately 520 ft. high and 2100 ft. long. The power plant is to be reinforced concrete construction to house four 75,000 kw. generators.

The third project, or Riverton project, is in the vicinity of Pavillion, Wyo., and will require 2000 ft. of concrete pipe and 1550 cu. yds. of concrete for construction of a lateral system on the Wyoming Canal extension.

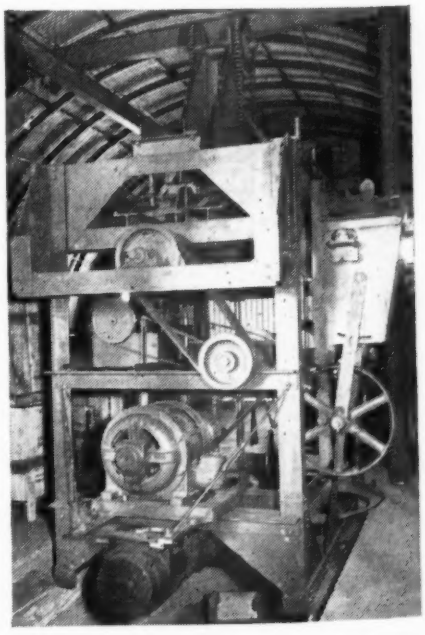
Bid calls are expected to be issued next month for the Missouri Basin Project which will require construction of approximately 2500 ft. of 63-in. monolithic or 60-in. precast concrete siphon for Cambridge Canal near Oxford, Neb.

Installs Equipment Costing $300,000

JANESVILLE SAND AND GRAVEL CO., Janesville, Wis., expects to reach a new high in block and ready-mix production this year following installation of $300,000 of new and replaced equipment. At present the block plant is turning out 4000 block per day, but capacity is reported to be well over 5000. Three sizes of block are made, 4-, 8-, and 12-in. Capacity of the ready-mix plant is 4000 tons per day. J. K. Jensen is president of the company.

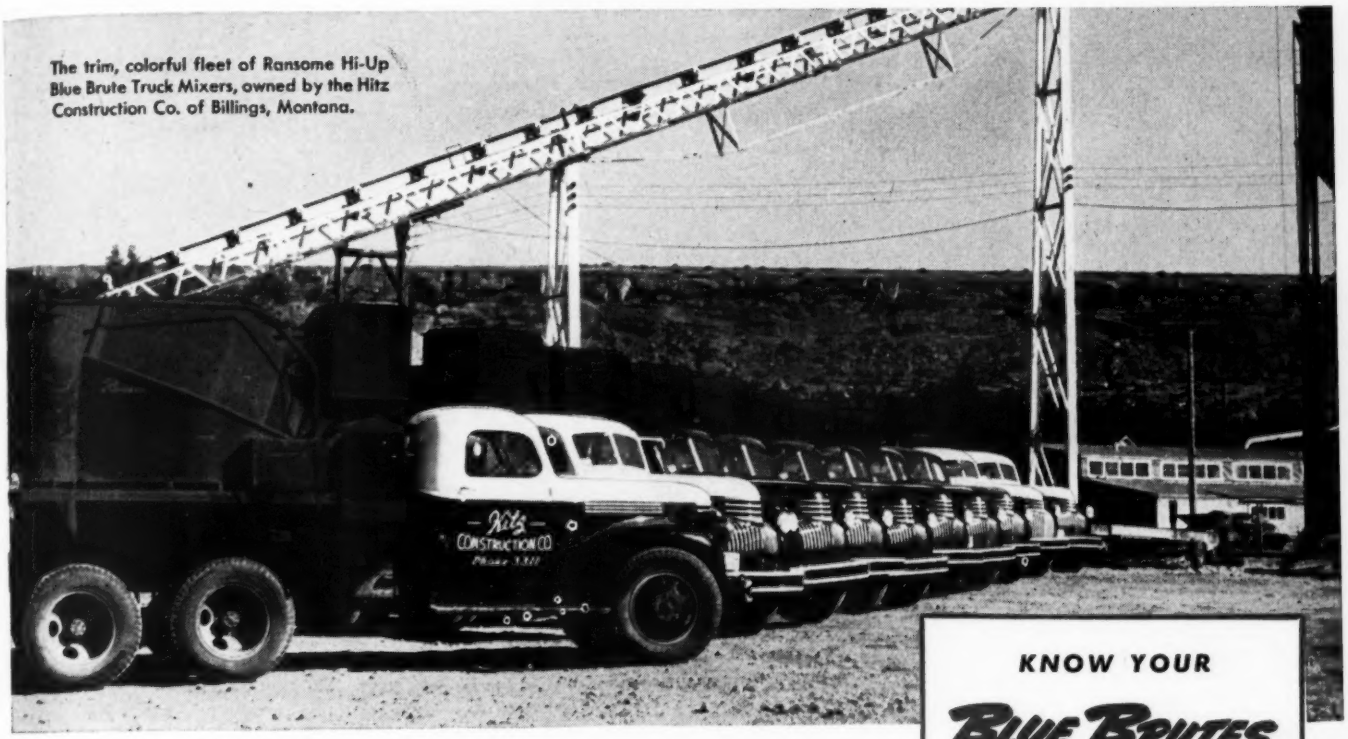
Two-Motor Drive Pipe Machine

CONCRETE PIPE MACHINERY CO., Sioux City, Iowa, has introduced a McCracken pipe machine with two-motor drive, permitting independent control of dual packer-heads. It is an improved Model "T" Bell-Up machine, having r.p.m. control of the packer-head that packs the barrel of the pipe and the bell-packer that packs the socket end. From 4- to 36-in. pipe can be made. According to the manufacturer, the change results in better bells and greatly improves the socket corner of the pipe.



Pipe machine with independent control of the packer-heads

HOW TWO HI-UPS BECAME A FLEET...



The trim, colorful fleet of Ransome Hi-Up Blue Brute Truck Mixers, owned by the Hitz Construction Co. of Billings, Montana.

Any time you want the real low-down on truck mixer performance, go to a fleet-owner! Such as Mr. Adam Hitz of the Hitz Construction Co., prominent in the present big expansion program around Billings, Montana, who writes:

"*We are building business on service and quality of materials. Blue Brute Hi-Up Truck Mixers are a large factor in giving this service.*"

Like many another ready-mix producer, the Hitz Co. chose Blue Brute Hi-Ups for advanced features such as: Engineered flexibility, eliminating operating strains . . . Ransome's exclusive mixing action . . . quick-charging hopper with non-jamming sealing door . . . simplified, trouble-free water system . . . plus simple, clean design that provides maximum accessibility to working parts and facilitates routine servicing.

And here's action that speaks louder than words. The Hitz Co., starting in 1946 with *two* Hi-Ups (serviced by a Ransome 56-S Big Mixer) now operates *a fleet of nine* Blue Brutes — conclusive, on-the-job proof of the Hi-Up's exceptional dependability and economy . . . To learn more about the many desirable features of these Blue Brute Hi-Ups, contact your nearby Worthington-Ransome Distributor, or write for Bulletin 221.

RB-1

KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your jobs on a profitable basis.

RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

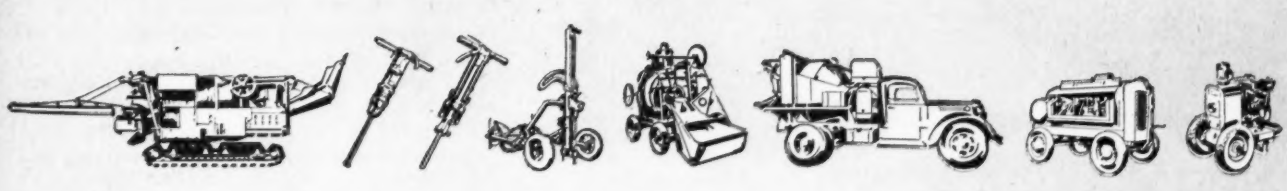
WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

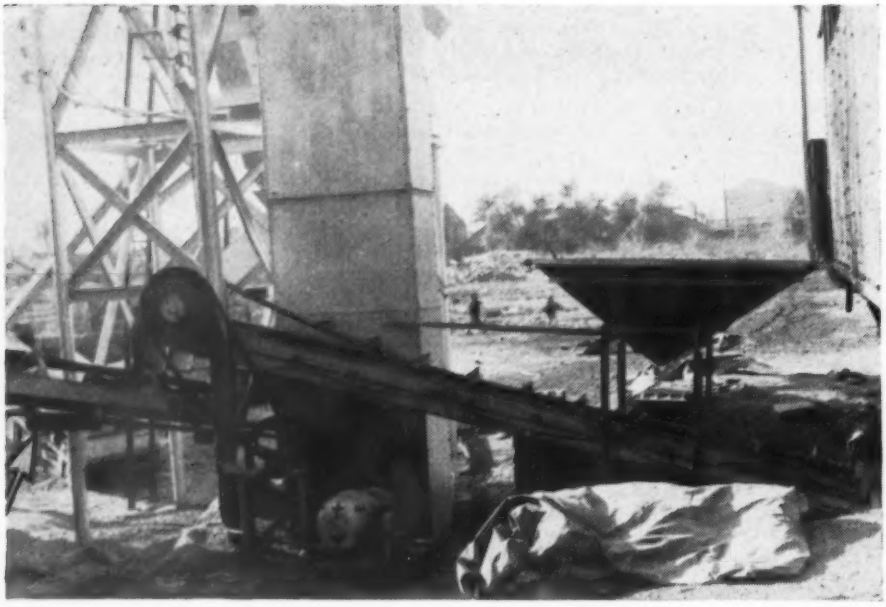
Distributors in all principal cities

NATIONAL READY MIXED CONCRETE ASSOCIATION NRMCA

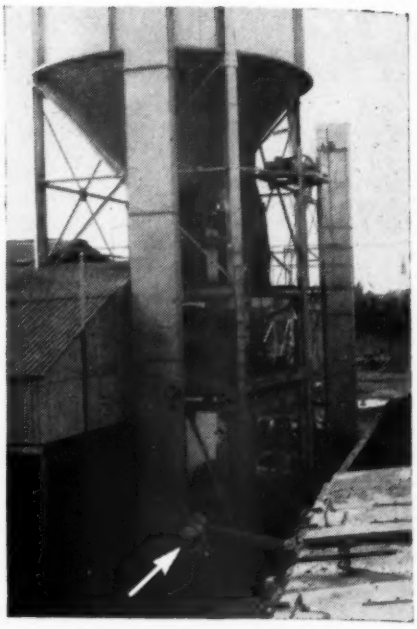
BUY BLUE BRUTES



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB



Showing drag-chain for aggregate recovery from track hopper, right. Power for drag-chain, bottom center, has throw-out clutch and may also be used to power bucket elevator. Steel framework to left supports screen and crusher, with swing conveyor visible, extreme left (arrow). Conveyor belt, left, feeds either swing conveyor or bucket elevator for overhead bin. Open hopper, right, which discharges to drag-chain, is an added provision for unloading a non-hopper bottomed car



Enclosed bucket elevator, left, receiving bulk cement from screw conveyor which reclaims material from track hopper. Power for both is supplied by a 15-hp. motor (arrow)

Giant Silos for Aggregate

E. P. BRADY & CO. has simplified the processing and handling of 2500-cu. yd. of gravel per day at its new aggregate plant, Flint, Mich., by the construction of three large silos over a belt-conveyor tunnel. Each silo is 30-ft. inside diameter and 30-ft. high above the circular concrete footing on which it is supported. They are 42 ft., center to center, with a 12-ft. web between. The crushed gravel moves up an inclined belt conveyor to a screen house above the silos where three 4- x 12-ft. screens separate the material into seven different sizes. Sand, ½- to ¾-in., and 1½-to 2-in., drops by chute to the three silos, while intermediate sizes are stockpiled around the silos. Processed gravel drops through a small roller gate at the bottom of the silos through an opening in a 96-in. Armco tunnel onto a 30-in. belt, which together with another ascending belt, 125-ft. long, deposits it in loading bins. Pioneer Equipment Co. supplied equipment.

Efficient Aggregate Handling for Concrete Products Plants

ALATEX CONCRETE PRODUCTS, INC., New Orleans, La., has installed a highly flexible system for meeting sizing problems presented by today's lightweight aggregate supply. From a drag-chain which moves aggregate from a track hopper, the material may be diverted to one of three points: an overhead storage bin; a crushing and screening station; or a swing conveyor for stockpiling.

After experiencing several failures using conveyor belting to recover aggregate from the track hopper, a plant-made drag chain was installed. This is essentially a single sprocket chain, with 12-in. long sections of angle iron bolted to it on 18-in. centers. At the upper end of the 27-ft. long inclined drag-chain trough, material is transferred to an 18-in. belt on 30 ft. centers which may be operated in either direction: discharging to a bucket elevator at one end or to a portable swing conveyor at the other. The 18-in. swing conveyor on 55 ft. centers is a Barber-Greene portable rig, powered by a Wisconsin gasoline motor and is used to stockpile aggregate. At the opposite end of the two-way belt from the swing conveyor, a bucket elevator elevates material 75-ft. to a three-compartment Blaw-Knox overhead bin with approximately 360-cu. yd. total capacity.

Near the discharge end of the drag-chain, a flop gate can be used to divert oversize material to a shorter bucket elevator on 30 ft. centers for elevation to a double-deck 3- x 5-ft. vibrating Telsmith screen. Oversize on

(Continued on page 166)

NEW LOWER PRICES ON ENTIRE EDGAR LINE!

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Lower manufacturing costs have made possible a substantial reduction in the price of all equipment in the proven Edgar Block-Making Machinery Line, including . . . Edgar's Vibra Shaker, Edgar's Mixer, Edgar's Hopper, Edgar's Mud Conveyor.

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JAEGER users have the advantage in the BUSINESS of selling concrete

Successful ready-mix operators have a strong preference for Jaeger truck mixers. Their operating records, showing faster loading and discharge time, more payloads averaged and fewer hours spent in the shop, represent one margin of advantage over less efficient fleets. In addition, Jaeger alone provides wet-mix plants with the sealed, top-loading drum they need to properly handle the maximum rated payload, and offers other operators whichever type of loading best fits their batching set-up and local aggregates.

As a result, Jaeger fleet owners produce more concrete than all others combined and sell every yard of it as top-quality material, dual-mixed to higher strength, accurately controlled for slump *and delivered without segregation over any length of haul.*

Send for new Catalog TM-8, showing latest HI-DUMP "Speed Merchants" in 2-3, 3-4¼, 4½-6⅛ and 5½-7⅜ cu. yd. sizes. We also build "Low Charge" truck mixers in 2 to 8 cu. yd. sizes.

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Positive water distribution with pressure pump and grout-proof, clog-proof jet

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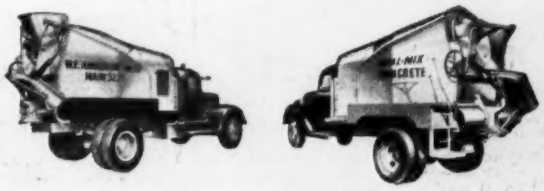
Fully streamlined — the only modern truck mixer on the road.

Choice of top-loading sealed drum or end-loading type



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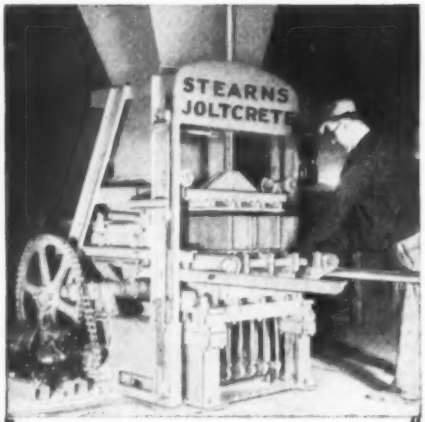

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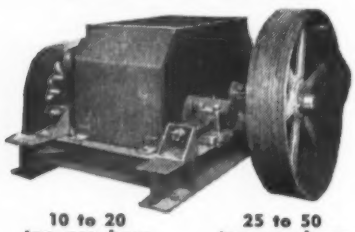

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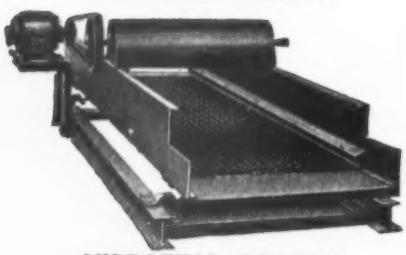

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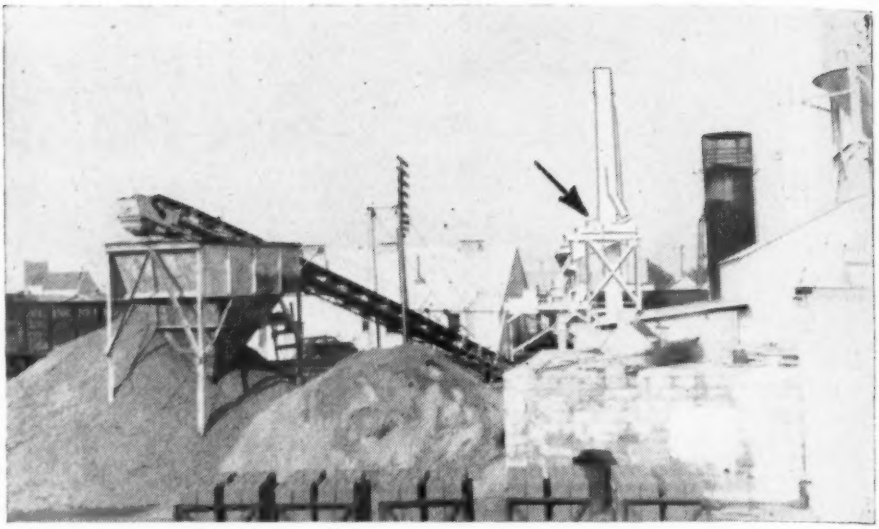

Discharge end of swing conveyor over aggregate stock pile. Arrow points to bucket elevator housing, double-deck screen and crusher

(Continued from page 164)

the first deck, plus 3-in. material, is chuted to waste; oversize on the bottom deck, minus 3-in., plus ¾-in., is chuted to a Telsmith cone crusher set for ⅜-in. opening. Throughs from the bottom deck of the screen, minus ¾-in., with the discharge from the crusher, may be diverted by means of a swing chute to either the stockpiling conveyor or to the conveyor for overhead bin delivery.

Bulk cement is conveyed to a bucket elevator from a track hopper by an inclined 24-ft. screw conveyor, with motive power supplied to both the screw and bucket elevator by one 15-hp. electric motor, mounted on a 4-ft. high concrete pier at the head end of the screw and the base of the elevator. The plant is an interesting example of modern building methods and materials, being built entirely of concrete and steel. The overhead bin and bucket elevator system, as well as the Besser Super Vibrapac, are mounted on concrete foundations that are not affected by vibrations from passing trains on a main line 50-ft. from the plant. The office building, curing rooms and storage space, are all constructed of concrete block, roofed with corrugated asbestos cement roofing.

Granted Contracts on Bull Shoals Dam

UNIVERSAL ATLAS CEMENT CO., Chicago, Ill., has been awarded contracts to furnish 270,000 bbl. of cement for construction on the $58,000,000 Bull Shoals Dam on White river in north-central Arkansas. The contract to build a seven-mile long installation of conveyor belts—biggest postwar belt application and second longest ever constructed — has been awarded to Goodyear Tire & Rubber Co.'s mechanical goods division.

A multi-purpose project, the Dam was authorized by government engineers to provide power, flood control and irrigation facilities. Concrete placing is due to start in mid-summer, and will require nearly three years to finish. In addition to the main haul system, Goodyear will supply 14,000 ft. of belt for the pit gathering and final classification operations.

Up Philippine Cement Production

CEBU PORTLAND CEMENT CO., Naga, Cebu, government-owned and the only cement plant operating in the Philippine Islands, produced 1,319,524 bags (of 94 lbs.) of cement in 1946, accord-

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EQUIPMENT DIVISION

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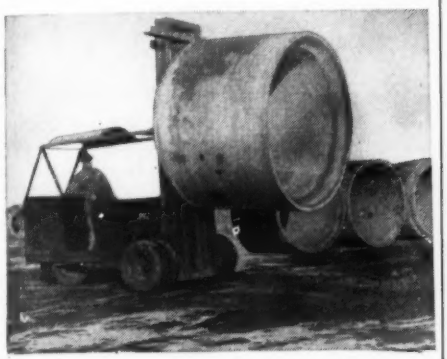
ing to statistics listed in *Mineral Trade Notes*, May, 1947.

The company expects to produce 3,000,000 bags this year by improving existing machinery, and 4,000,000 bags in 1948, 6,000,000 in 1949, and 8,000,000 in 1950, depending on the purchase of new machinery and the building of a new plant.

The company produces a standard portland cement under the trade name "APO," using the wet process. Before the war the company produced a Pozzolanic cement under the trade name "Di-Sillie."

Lift Trucks in Four Types

ERICKSON SPECIAL EQUIPMENT MFG. CO., Minneapolis, Minn., has announced that four types of lift trucks are now available, a platform type for handling racks from the end, and



High lift fork truck especially adaptable for handling pipe

three fork types, all equipped with International power units.

A recent model, the "Super-Special" high-lift fork truck, has been designed especially for the handling of concrete pipe up to 84 in. in diameter. It has a tilting or rigid mast, hydraulic steering, an improved hoist cylinder, and a 6-cyl. International engine. The other fork models are the Standard Hi-Lift and Special Hi-Lift fork types which handle racks from the side, and are said to be especially adaptable for handling cubes of block as well as for handling racks of materials.

Brick-Faced Block

AMERICAN BRIC BLOCK CORPORATION, Minneapolis, Minn., is licensing concrete products manufacturers to make its patented Bric-Blocks, having colored facings simulating brick masonry. The block are made by the cast or wet mix system by pouring into molds without tamping.

Buy Rope Clamp Rights

CABL-OX CORPORATION, Chicago, Ill., has announced the purchase of entire and exclusive rights to Cabl-Ox wire rope clamp, Cabl-vise and allied wire rope products which will be manufactured and merchandised on an enlarged and accelerated plan.

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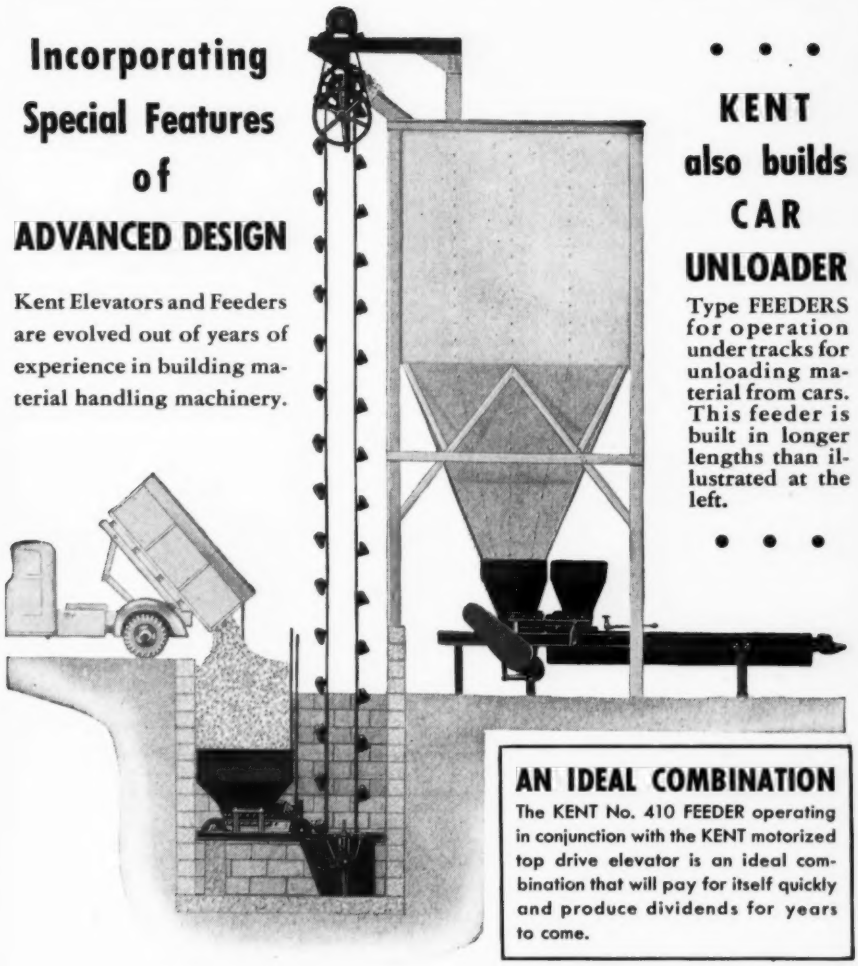
Incorporating Special Features of ADVANCED DESIGN

Kent Elevators and Feeders are evolved out of years of experience in building material handling machinery.



• • •

KENT also builds CAR UNLOADER

Type FEEDERS for operation under tracks for unloading material from cars. This feeder is built in longer lengths than illustrated at the left.

• • •

AN IDEAL COMBINATION

The KENT No. 410 FEEDER operating in conjunction with the KENT motorized top drive elevator is an ideal combination that will pay for itself quickly and produce dividends for years to come.

No. 410
ADVANCED MODEL FEEDER

For handling sand, crushed stone, aggregate, etc. from hopper or Gondola Car.

It is driven steadily and smoothly by the elevator motor through the elevator belt. Material is continuously fed into boot by long-life rubber belt — pressure, grease lubricated anti-friction bearings — rollers support belt at intervals.

Adjustable hopper gate governs volume of material fed into elevator boot.

No. 139
KENT MOTORIZED ELEVATOR

Constructed entirely of high grade approved materials. All metal except belts.

Unit drive is by electric motor through V-belts. Shafts revolve on anti-friction pillow blocks, pressure grease lubricated.

Elevator is easily attached to bin by means of heavy channels at right angles to main members.

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Manufacturers of CONCRETE PRODUCTS MACHINERY Since 1925
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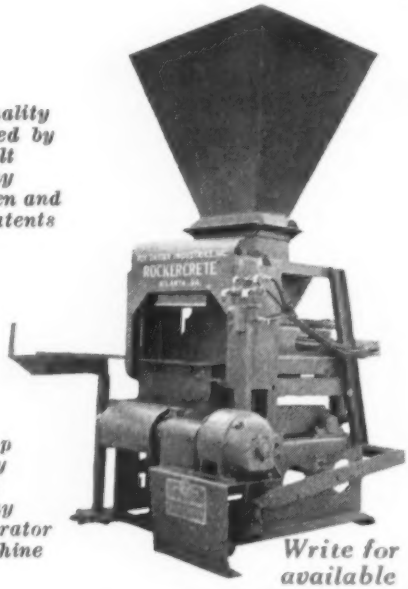

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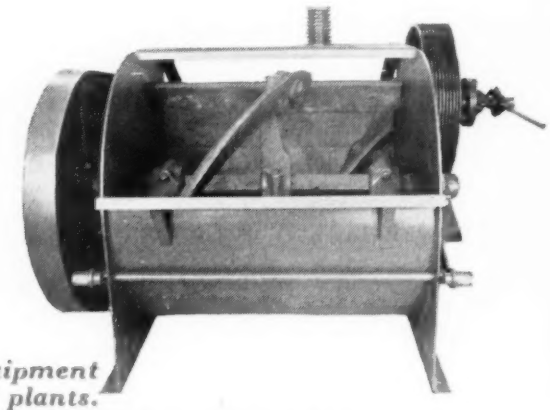

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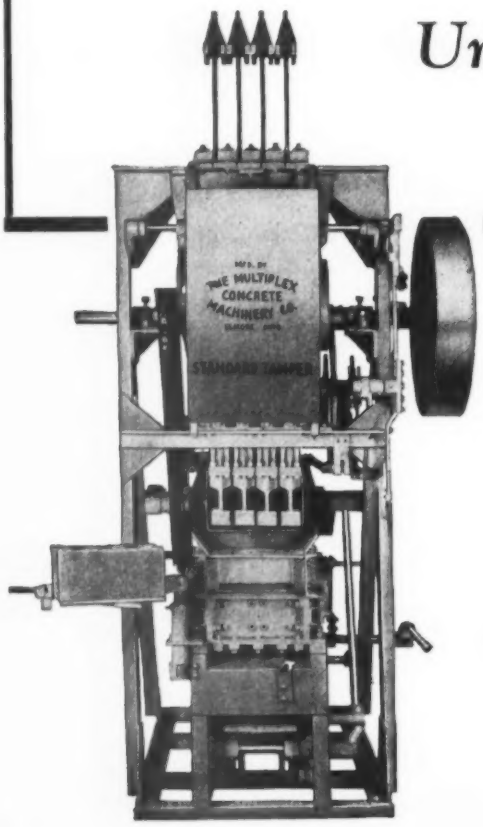

"Old Reliable" itself, this economical machine which produces three to four 8"x 8"x 16" blocks of uniform high quality every minute day after day with minimum maintenance.

It may be purchased as a hand-operated stripper and a strike-off machine which can be converted into a power-operated, semi-automatic machine later. It is supplied with either 4 or 8 tamping bars. Write for complete catalog today!

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LIGHTWEIGHT Concrete in Germany

By DR. F. O. ANDEREGG*

LIGHTWEIGHT CONCRETES may be divided into three classes: (1) where the lightness depends upon the aggregate, including: pumice, expanded slag, granulated slag, diatomaceous earth, cinders, perlite, Haydite, also saw dust and excelsior straw and cork; (2) application of sized aggregate to produce an open structured concrete; and (3) foam and gas concretes.

Cement products seem to fall into two strength categories. Those above a unit weight of about 75 p.c.f. seem to follow a law indicating a steep increase in strength with density as shown in Fig. 1; whereas those below this weight have a low rate of strength increase with unit weight. The ratio of flexural to compressive is higher for these lightweight concretes, being of the order of 1:3. For practical application as precast units, and especially to withstand handling, the compressive strength should be at least 420 p.s.i. and 560 would be much safer. Generally, those units made with light weight aggregates, such as pumice, are denser and stronger, and it is economically feasible at densities of 45 to 62 p.c.f. to secure strengths ranging from 250 to 1000 p.s.i. In comparison, to obtain a compression strength of 700 p.s.i. would require about a density of 85 p.c.f. with slag or Haydite, or about 50 p.c.f. with wood shavings.

The relationship between density and thermal conductivity is shown in Figs. 2 and 3. The moisture content has a great deal to do with the values obtained, as does the nature of the aggregate. Slag sands gave low transmission factors, while quartz sand permitted more heat loss. Conductivities ranging from 2.0 to 4.8 have been obtained from concretes having the same density as water.

Gas Concrete

In making gaseous concrete, in addition to the usual variable factors, temperature control of the rate of gas evolution and special means taken to control shrinkage are important. A typical example of such material is Siporex from Stockholm where it is prepared from a slurry of cement and silica, expanded with the aid of aluminum powder and then hardened under steam pressure. Reinforcing is used for slabs up to 13 ft. long. On artificial drying strengths of 370 p.s.i. at 37 p.c.f. and 280 at 30 p.c.f. have been obtained. Bending strengths run about 100 p.s.i. The modulus of elasticity in compression for the loading range of 40 to 200 p.s.i. is of the order of 250,000 p.s.i. for blocks and 140,000 for slabs. Volume change on wetting and drying is quite small.

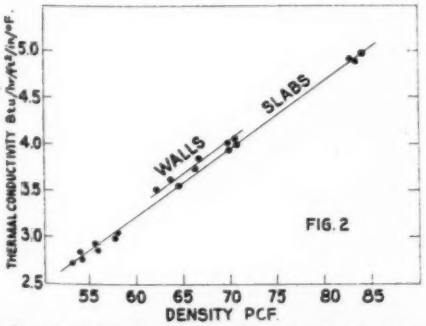

Fig. 2: Thermal conductivity of cellular concrete (containing 5 per cent moisture by volume)

Experiments have been made in the Stutgart Technical School with concrete expanded with the aid of aluminum powder. At about 50 p.c.f. the flexural strengths varied from 310 to 440 p.s.i. and the compressive strengths from 780 to 1000 p.s.i., with a cement content ranging from 5½ to 6¾ bags per cu. yd.

Lightweight concrete has also been prepared with the aid of calcium carbide, the grains of which had been coated with aluminum, by the Asmus method. Typical results obtained at a density of 55 p.c.f.; flexural, 300 p.s.i.; compressive, 800 p.s.i.; shrinkage, 0.06 per cent. Other gas concretes, after seven-day moist storage and six months drying, shrank from 0.01 to 0.035 per cent, the lighter the material the greater the shrinkage. It is very desirable to permit and require that lightweight concrete units should dry out thoroughly before use.

One very effective method to control shrinkage involves steam hardening. After three or more hours the units may be placed in an autoclave and cured under steam pressures ranging from 110 to 140 p.s.i. For this process, some cements seem to work better than others, while a finer sand should be used.

Another means of forming gas concrete involves hydrogen peroxide and chloride of lime. After autoclaving, the strengths and especially volume change characteristics seemed to be satisfactory; e.g., at a density of 50 p.c.f. the flexural strength ran about 300 p.s.i. and the compressive, 600.

Foam Concrete

A good example of foam concrete is Iporite. However, to secure 280 p.s.i. it seems to be necessary to go to gravities above unity. Betocell is another example of foam concrete.

Concrete with Wood Shavings

It is not difficult to prepare slabs of satisfactory strengths at unit weights of 45 to 50 p.c.f., but shrinkages are quite great, reaching as high as 0.5 per cent.

*Translation of a lecture delivered by Professor Otto Graf before the German Concrete Society in 1944 in Berlin. The subject is just as pertinent today, since to accomplish a tremendous reconstruction job, Germany has very little wood or steel and must depend upon cement products or rubble masonry.

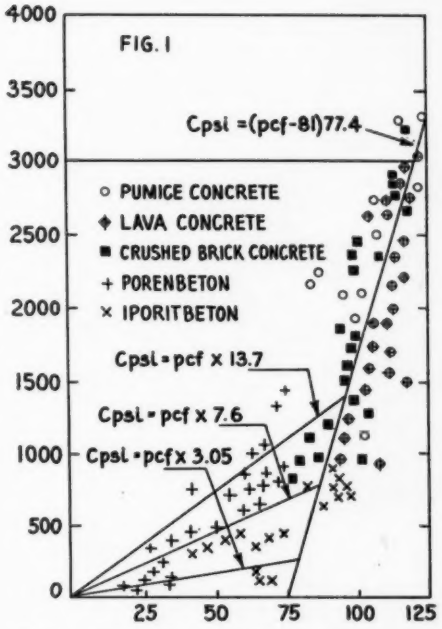

Fig. 1: Compressive strength and density graph of various types of lightweight concrete

Reinforced Concrete

For floor slabs, reinforcing may be used, and the moduli of elasticity and rupture are important as well as the resistance to creepage of the steel. Pumice concrete units have even been prestressed, with the aid of cement grout around the steel and with strengthened compression zones. Gas concrete can be reinforced; but if the steel is simply included within the mass its resistance to creepage is quite low. If the reinforcing is placed in grooves in the concrete with high strength mortar, it is not difficult to take advantage of the strength of the steel up to its yield point. In this way, bending strengths may be obtained higher than compressive strengths. In the design calculations, the ratio of the elastic modulus of steel to that of concrete is about 100 at 50 p.c.f. However, exact control is necessary in the fabrication of such units.

Very encouraging results have been obtained with pumice and with expanded slag concrete in the heavier units, while steam cured gas concretes have been very satisfactorily employed in the lighter categories. The chief concern is to provide adequate resistance to handling these materials.

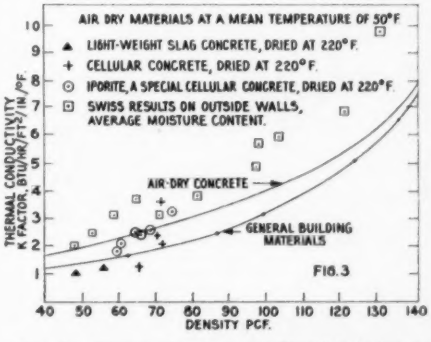
AIR DRY MATERIALS AT A MEAN TEMPERATURE OF 50°F.
LIGHT-WEIGHT SLAG CONCRETE, DRIED AT 220°F.
CELLULAR CONCRETE, DRIED AT 220°F.
IPORITE, A SPECIAL CELLULAR CONCRETE, DRIED AT 220°F.
SWISS RESULTS ON OUTSIDE WALLS, AVERAGE MOISTURE CONTENT.
THERMAL CONDUCTIVITY K FACTOR, BTU/HR/FT²/IN./°F.
AIR-DRY CONCRETE
GENERAL BUILDING MATERIALS
FIG. 3
40 50 60 70 80 90 100 110 120 130 140
DENSITY PCF.

Fig. 3: Curves showing relationship between density and thermal conductivity

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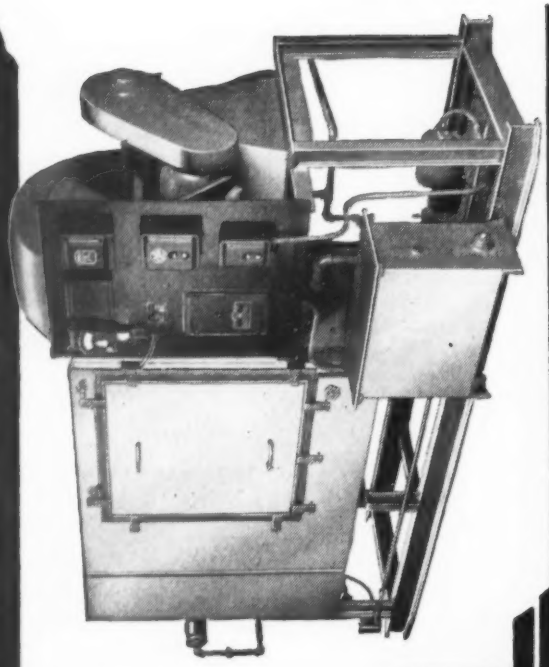

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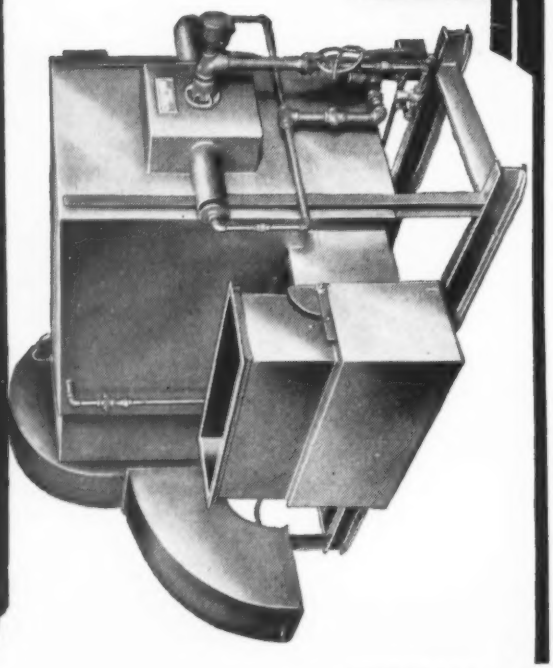

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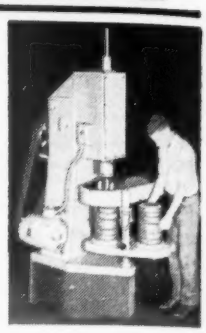
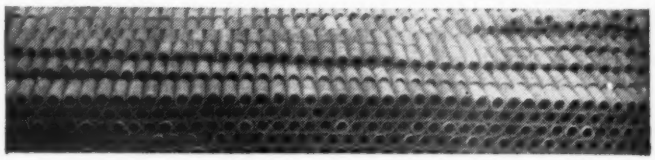


The market for drain tile is HUGE. Demand is increasing much faster than supply. Farmers urgently need it to increase soil fertility and crop productivity . . . and have the money to buy. More cement tile plants are needed—badly—throughout the country.

Besides farm drainage, other projects require millions of cement tile. Home building . . . road construction . . . sub-division development . . . and many others.

Manufacturing is easy. Market opportunities are unlimited. Profits are generous. Champion Drain Tile Machine makes the finest tile ever developed—strong, dense, true. Better than clay tile, yet can be sold for less. Made in local plants, of local materials, by local labor, for local market. Requires only a moderate investment. Write for full details.

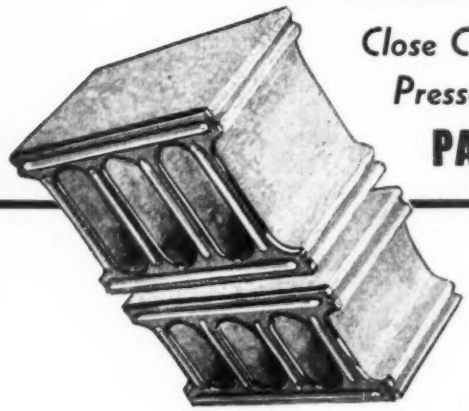
Concrete Equipment Co. 560 Ottawa Avenue, Holland, Michigan



Better Blocks—Lower Cost

With COMMERCIAL

Close Clearance Pressed Steel **PALLETS**



★ Clearance to $\frac{1}{8}$ in. of sides of mold box means sharp edges, even with finest aggregates.

★ Maximum rack and kiln capacity. Cored pallets designed for each unit made.

★ Lighter weight. In normal day's operation, Commercial cored pallets saves 44 tons of moving compared with cast iron pallets—54 tons as compared with solid steel pallets.

★ Ribbed, pressed steel for greater accuracy, extra strength.

★ Produce mortar groove.

Made in sizes and styles to fit any block machine. Write for details. Complete engineering service available at no cost.

THE COMMERCIAL SHEARING & STAMPING CO.

Youngstown, Ohio

Photo courtesy The Euclid Road Machinery Company

The belt with the book in the seat of its pants

A typical example of B. F. Goodrich product improvement

YOU remember the kid who, knowing he was going to get a spanking, put a book in his pants to take the blows. The B. F. Goodrich conveyor belt in the picture is built that way, for the same reason.

A loader, used in building airports, roads, etc., dumps up to *20 tons a minute* of dirt and heavy gravel onto an inclined conveyor belt which rushes them up into that big earth-mover. No ordinary belt could stand the shock, speed, and cutting. The inventor of the machine called in B. F. Goodrich men, who designed a special belt, using the same shock absorption principle as the lad with the book in his pants. They put a layer of extra-heavy nylon cords across the belt, just beneath the surface, that cushioned the hard shock of blows that would otherwise be shattering "body blows", right to the body of the belt.

This same B. F. Goodrich belt, (Pat. No. 2,310,818) with the "transverse nylon cord breaker", as it is called, that solved the inventor's problem, is setting new records for long life and trouble-free operation on construction jobs, coal mines, quarries, ore mines and wherever else shock load is common. It is outlasting former belts many times. Your B. F. Goodrich distributor can show you its unique construction and give you prices for your installations.

In fact whatever your material handling or power transmission problem, B. F. Goodrich almost certainly has a belt that will solve it and save you money in the process. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich

FIRST IN RUBBER